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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Linseed Crops.

Linseed for grain was tested in 1919-20 at Mount Gambier, Turretfield, Kybybolite, Millicent, Penola, and Lyndoch. In the last three localities the crop was a complete failure, whilst at Turretfield (4.63bush. to the acre) and Kybybolite (2.27bush. to the acre) results were poor. At Mount Gambier, on the other hand, on Mr. A. A. Kilsby's farm, 4.7 acres yielded grain at the very satisfactory rate of 22bush. to the acre; the gross return per acre of this crop amounted to £25 17s. A good deal of local interest in flax has been aroused as a result of these experiments, and it is anticipated that several farmers will take it up in the present season. There seems to be no doubt that given good soil and careful tillage we can readily grow flax for seed in districts in which the average rainfall is within the neighborhood of 20in. Fortunately, it is a crop the handling of which calls for no more labor than is demanded by ordinary cereal crops; and should local prices continue satisfactory, there is no reason why flax should not occupy a regular place on many farms of our moister districts.

### Pruning Tests.

Dealing with the pruning tests conducted at the Government Experimental Orchard, Berri, during 1919, the Manager (Mr. C. G. Savage) reports that the Royal apricot, as in 1918, gave the heaviest yield from trees whose leaders were pruned to definite dormant buds, but the average over the three seasons' treatment of this variety is in favor of the trees whose leaders were pruned to the "unstopped" system. The Moorpark variety, on the other hand, for the third year in succession, produced the heaviest crops from the trees whose leaders were pruned in the popular style, to definite dormant buds. The Early Crawford peach, again, gave the greatest weight from the trees pruned with "unstopped" leaders, whilst the Elberta gave the heaviest yield from the trees pruned with leaders cut to definite dormant buds. Similar results were obtained in 1918, but in 1919 the "unstopped" leader system gave the greatest weight of fruit. The average returns for the three seasons' work on this variety are in favor of the trees with leaders pruned to definite dormant buds.

### Condition in Dairy Stock.

Dairy stock should never be allowed to get down in condition at any time, more especially when facing the winter; such results in their having to receive more food later on to build them up again than would have been necessary had owners kept them fed. Animals in good strong condition consume less in proportion than when in low condition. The only way to have the dairy stock in fit condition

to face the winter is to start feeding early and keep them strong. Often it is felt by cow-keepers that they are not too sure of having sufficient food to see them through; thus they delay feeding, and stock become weak.—The Government Dairy Expert.

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#### Tetanus.

Deaths from this disease have been comparatively few (says the Chief Inspector of Stock in his annual report for the year 1919-20), the majority of cases occurring among male lambs on farms where castration was performed in a rough-and-ready way. Those who undertake the marking of lambs should never fail to do their operations on strictly hygienic lines. The organism of tetanus is ever present in manure about sheepyards, and readily gains entrance into the operation wounds with either mud or dust. To avoid trouble, fresh localities should be selected each year. After the lamb has been operated on, it should be gently dropped out into the paddock on clean ground. In addition to disinfecting knives, hands, &c., it is highly important to see that the scrotum (purse) is free from dust or mud before making the operation wound. In a recent publication on the "Management of Sheep" a writer advises the following mixture as a strong disinfectant:—Water, 15 parts; standard liquid dip, one part; molasses, two parts; and a little iodoform; splash the crutch and butt of tail well.

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#### Important Discovery in the Cause of Isle of Wight Bee Disease.

Dr. Rennie, of Aberdeen University, in collaboration with Miss Elsie J. Harvey and Mr. P. Bruce White, have brought to a successful issue the investigation into the cause of Isle of Wight disease in bees, which has caused extensive destruction to stocks throughout the country (says the *Gardener's Chronicle*). The cause of the disease is believed to be a minute mite of a new species, which it is proposed to call *Tarsonemus Woodi*. The mite enters the breathing tube of the bee and blocks the air passage, thus cutting off the supply of oxygen from certain muscles and nerve centres concerned with locomotion. Isle of Wight disease first became known about 1904, and gradually spread from the south of England to the north of Scotland.

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#### Horses at the Wheat.

A horse engorged with wheat should be allowed to drink as much as possible, and given brisk exercise, says Mr. F. E. Place, B.V.Sc., M.R.C.V.S. It should be given big enemas of warm soapy water, and drenched with  $\frac{1}{2}$  lb. of baking soda in one quart of warm milk, which should be repeated in an hour or two if necessary. The animal should be bled three quarts at the neck, and its belly and flanks should be rubbed well and often.

**Experiences Abroad.**

A large number of members of the Agricultural Bureau served abroad with the A.I.F., and the opportunity they were thus afforded of acquainting themselves with the agricultural practices of other countries were not neglected. And having themselves profited by their experiences, they have not hesitated to pass on to their Branches the knowledge thus acquired. In fact, there must be few Branches of the Bureau which have not, during the past year or so, had the privilege of listening to a paper headed "Notes from Experiences Gained Abroad with the A.I.F.," or with some similar title. And it must be stated that these papers generally have been of a high order. The writers have come back with their training broadened by experience of other countries. They have been enabled to contrast the practices of other countries with those of their own. Where the latter have fallen short, they have not hesitated to point to the fact, and suggest improvement. Foremost amongst those who are rendering service in this way must be mentioned Mr. W. S. Kelly (Vice-Chairman of the Advisory Board of Agriculture). Before Mr. Kelly went overseas he had earned for himself a reputation as one of the foremost farmers in South Australia, and he returned with a tale to tell, both interesting and instructive. He told it first at the Thirtieth Annual Congress of the Agricultural Bureau held in Adelaide, and subsequently at a number of country Branch meetings. He is now, in response to numerous requests, about to visit the South-East, where he will lecture before a number of Branches of the Bureau during March.

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**The Apple Season, 1921.**

The first of the present season's shipments of apples was made in the s.s. *Beltana*, which sailed for London at the end of February. The total shipment was 6,947 cases of apples, and the majority of the consignment was made up of Cleopatras, Jonathans, and Dunn Seedlings. The fruit generally was in splendid condition, but some of it was picked a little too green, and may be subject to wilt on the voyage: but this trouble is always experienced with the early shipments, as growers are obliged to pick some of their fruit a little too early. The industry is suffering under great disabilities, as the total charges and freight amount to about 75 per cent. of the gross price likely to be received for the fruit in England, and although strong protests have been made against the charge of 8s. a case freight, no relief can be obtained. In pre-war days the freight was only 2s. 8½d. a case, and with a market not likely to be much higher than pre-war prices, the growers have to take very great risks in incurring such heavy expenses for such little return. The Trade Commissioner has cabled that it is expected that the market for Australian apples will open at about £1 a case for the best quality, with inferior fruit selling at much lower prices. Speculative offers which would return about 7s. and 7s. 6d. per case, f.o.b., Port Adelaide, have also been received, and the general opinion is that prices will range from 16s. to 20s. a case gross, so growers will

be very unwise to ship anything but the well-known varieties, and should pay strict attention to quality. There will be a fairly large quantity of stored American apples still on the market when our first shipments arrive; but our fresh fruit will be more attractive to buyers, and will only have strong competition from the boxed American Newtown Pippins; but these are even now selling at from 18s. to 20s. per case. There is a good crop in this State, and the fruit is clean and well grown. Tentative arrangements have been made for seven shipments during February, March, and April, with a total quantity of approximately 60,000 cases. The only difficulty in regard to shipping is that there is a very limited amount of space allotted for March shipments, owing to the fact, it is believed, that the British Government are reserving most of that month's refrigerated space for lifting their butter purchases. As March is the principal shipping month, this is very unfortunate, and efforts are being made to have the space allotments increased.

#### **The Salt and Gypsum Resources of South Australia.**

Bulletin No. 8, of the Department of Mines of South Australia, deals with the salt and gypsum deposits of South Australia. The report is by Mr. R. Lockhart Jack, B.E., F.G.S., Deputy Government Geologist. In a letter of transmittal the Government Geologist (Mr. L. Keith Ward) points out that this report deals in a systematic way with all the deposits of salt and gypsum known to exist within the range of possible economic exploitation under conditions that exist to-day or may exist in the near future. Many other deposits are known to occur, but are so remotely situated that their future utilization is quite uncertain. Both primary and secondary industries are concerned with the production of salt and gypsum, which are among the most widely used of all minerals. It is no exaggeration to say that no one dispenses entirely with salt and its numerous derivatives, while there are few in any community who do not require materials prepared from gypsum. South Australia is specially well-endowed with both salt and gypsum, of which a very large proportion of the Australian production has been obtained hence in the past. The prospects for the expansion of the industry are excellent, and the facilities offered within this State are discussed in detail in this report. An interesting proof of the dependence of Australasian industry upon the South Australian production of these minerals was afforded in war time during the period of most acute shortage of shipping space by the preferential allotment of space for salt and gypsum in ships trading between the States of the Commonwealth.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. Loxton, B.V.Sc., Government Veterinary Surgeon.]

"W. H.," Spalding asks for treatment for a mare which scours when driven.

Reply—She requires careful feeding. Water her before feeding. Do not drive her immediately after a feed. Give her one tablespoonful of Fowler's solution of arsenic twice daily in the feed for a fortnight.

"L. R.," Pata, reports death of horse through eating paddy melons, and asks for preventive measures in case of further trouble.

Reply—The cause of death was probably obstruction of the bowel. On account of the stringy nature of the plant this trouble often results where horses eat freely of the paddy melon. Your treatment was not energetic enough. Give raw linseed oil, 1 pint to 1½ pints, with two tablespoonsful of turpentine, and repeat in 12 hours, if necessary. Frequent enemas of warm, soapy water are useful. Inject 3galls. or 4galls. slowly every two or three hours.

"A. B.," Neeta, has cow with swollen eye. The eyeball is covered with a yellow film.

Reply—Bathe the eye frequently with boracic lotion, made by dissolving a tablespoonful of boracic acid in a pint of water. Apply a little of the following:—Yellow oxide of mercury ointment, 1 per cent. Place a small piece of this beneath the lower lid once daily.

"P. W.," Pompoota, asks whether paddy melon when eaten by horses has any harmful effects on the animals.

Reply—It is popularly believed that the melons (fruits) of this plant cause blindness. This, however, has not been proved by experimental feeding of the melon to horses. The vine often causes impaction (obstruction) of the bowel on account of its stringy nature. The treatment of this complaint consists in giving raw linseed oil or other laxative medicine, and frequent and copious enemas (injections) of warm, soapy water. You should, however, take whatever measures are necessary to keep the filly from eating the plant.

"E. T.," Mount Bryan, reports:—(1) Draught horses with an irritation of the legs; and (2) a young horse with a slightly enlarged knee, caused by a kick.

Reply—(1) The irritation of the legs is due to a skin parasite. Try the following treatment:—Clip the legs, if possible. Wash thoroughly with warm water and soft soap or water containing a little washing soda. When dry, apply a mixture of one part of sulphur to four of oil or lard, and rub this in thoroughly. Repeat the treatment three times, at intervals of a week. (2) Put him out of work for a month. Apply a little red blister. Rub this in for 5min. Tie his head up short for an hour after applying the blister.

"C. P. W.," Reynella, asks, "Is it possible to cure splints on a horse?"

Reply—The application of red iodide of mercury blister in the case of the six-year-old horse will effect some improvement, if it does not cure. Make the blister up as follows:—Red iodide of mercury, 1 dram; lard, 1oz. (mix). Apply this with

smart friction for five minutes. Tie up the horse's head after the blistering, so that he cannot reach it with his mouth. In the case of a young horse, you should remove shoes and put him out of work. If there is any heat in the leg give it plenty of cold water irrigation. You can apply the same blister in three months' time if it then appears desirable.

"A. H. J." Gawler, asks method of dehorning cow.

Reply—The horns may be taken off close to the skull. This operation is usually performed with a special guillotine, but a clean, sharp tenon saw is quite effective. The operation is a painful one, and the cow must be properly secured. A good deal of bleeding follows, but does not call for any special treatment. The operation is best done at a time when there is little danger from flies. Apply a dressing of Stockholm tar.

"A. L. P." Jamestown, reports Jersey cow with twin calves of opposite sex, and asks if both animals will breed.

Reply—In the case of bovine twins the female is generally barren when the calves are of different sexes. When both calves are female the same thing sometimes occurs. This female is known as a free martin, and is barren because of imperfect genital organs, so that female twins with normal genital organs are naturally productive.

"J. P.," Gladstone, reports death of young horse. After showing acute symptoms of colic, horse died. The barrel of horse was very swollen. P.M. showed a number of bots.

Reply—It would appear that the cause of death was acute flatulent colic. There is a very marked difference in the lining membrane of the right and left parts of the stomach of the horse, which is very often mistaken for disease, the part nearest the gullet being white color and smooth, while the other is pink and velvety. There is a distinct line of separation between them. You have probably considered this as inflammation. There would be very little visible alteration in the organs from disease when death took place so quickly, but putrefactive changes set in very early. If present in large numbers bots might predispose an animal to attacks of colic.

"E. E." Kimba, reports mare with a large wound inside the hind leg.

Reply—The reason for the development of a large cavity in the region was the bruising and subsequent sloughing of the injured tissues. Dress it daily by first cleansing with warm water and washing soda, and then Condy's solution. Cover the wound with dry powder such as zinc oxide or boracic acid.

"E. A.," Tantanoola, reports four-year-old horse with a chronic discharging wound under the jaw, as a result from strangles.

Reply—This wound should be opened up. Clip the hair off the region. Cleanse. Enlarge the skin wound. Explore the opening with a probe to find out the direction from which the discharge is coming. Open this up with a clean, sharp knife so as to give free exit to discharge, &c. Get a household enema syringe and wash the cavity out daily with a solution of carbolic acid (one tablespoonful to a pint).

"H. H. T." Borrika, has aged mare with loss of appetite, stiffness in limbs, and swelling under belly.

Reply—Give her Epsom salts, 2 packets; saltpetre, 1 teaspoonful, twice daily in the feed or drinking water for a few days. Give her sufficient soft food to keep bowels relaxed. Substitute chaff for hay, and give crushed oats and bran. Inspect teeth, and, if necessary, have them attended to.

"W. W.," Karoonda, reports cow with large swelling between teats. Milk is curdled.

Reply—The cow has mammitis. You should foment the affected quarters with warm water several times daily. Strip out both quarters frequently and thoroughly. Dry after fomenting, and give plenty of gentle hand rubbing with camphorated oil. The swelling between the teats may develop into an abscess. Report again in a week.



"E. E.," Port Lincoln, asks method of castrating a two-year-old colt in which the testicles are not showing.

Reply—I advise you not to attempt this operation, which must be done under chloroform, and for which some surgical knowledge is necessary.

"W. G. McN.," Teal Flat, reports colt six months old, large swelling around testicles.

Reply—He is suffering from a scrotal rupture. It is not advisable to do anything until the usual time for castration, when, if the condition is still present, this operation may be performed in a special manner. Frequently this form of rupture disappears by the time the colt is 12 months old.

"E. B.," Cleve, asks (1) treatment for cow with small hole in one teat, through which milk escapes; (2) is a cow likely to have milk fever more than once?

Reply—(1) This is a milk fistula, a common sequel to wounds of the teat. It should respond to treatment if you are able to dry her off. You should then cauterise the small opening with a pencil of lunar caustic. Apply carefully to the walls of the fistula. (2) Heavy milkers in the prime of life are predisposed to milk fever. The fact that a cow has had milk fever, however, is not a sufficient reason to dispose of a good cow to the butcher at the end of the present lactating period. The mortality from this disease under proper treatment is so small that I would advise you to keep her if she is otherwise suitable.

"G. B.," Secretary Agricultural Bureau, Shoal Bay, reports nine-year-old gelding very lame, fetlock and chest swollen. Horse does not rest foot on the ground. Information is also asked as to what should be done in the case of a horse's shoulder where a boil burst, and left a calloused lump.

Reply—From the symptoms described I would suggest a close examination of the foot. The holding up of the foot is very suggestive of a punctured wound in this region. If you can locate the puncture, cut away the horn carefully, so as to allow any discharge to escape. It will be much easier to do this if you put a warm bran poultice on the night before. Syringe the wound out daily with disinfectant lotion, and keep the foot clean by wrapping it in a piece of cornsack. If you are still of the opinion that the trouble is in the fetlock, apply warm fomentations two or three times daily. Put him on laxative food, and give him 2ozs. Epsom salts daily in his feed or drinking water. Boil on horse's shoulder. Use any mild astringent lotion, such as Condyl's crystals in water, and dress daily. The swelling remaining will always give trouble if the horse is kept at work.

"B. J.," Secretary Agricultural Bureau, Wilmington, asks if it is advisable to milk a cow prior to calving.

Reply—Yes; it is sometimes desirable, but only sufficient should be removed to relieve the tension.

"F. W. B.," Meadows South, reports cow been "in" two months. Milk flow suddenly stopped. Animal very stiff in hind quarters, and has lost condition.

Reply—Give her the following powders:—Strychnine sulph., 6grs.; sacch. alb., 2 drams; mix; divide into 12 powders. Give one on tongue twice daily. These powders should be dispensed by the chemist. If the udder trouble has not cleared up, you should apply frequent warm fomentations if there is any heat or pain. Frequent milking of this quarter, gentle hand massage, and the application of some mild stimulant such as camphorated oil are also indicated. Apply the latter after drying the quarter, and especially after the last milking at night.

## RANDOM AGRICULTURAL JOTTINGS.

[By ARTHUR J. PERKINS, Director of Agriculture.]

In a recent issue of the "Journal of the Ministry of Agriculture" (British) there is an interesting article by Dr. A. G. Ruston, of Leeds University, on "Pig Feeding and the Cost of Pork Production." Apparently, in spite of rising imports, the pig industry is on the decline in Great Britain. The point that mainly attracted my attention was the enormous value of recent imports of pig products into that country, and the reflexion was inevitable that we are doing little or nothing towards taking advantage of this friendly market. I have already on various occasions pointed out that prior to the war British imports of pig products (mainly bacon and ham) aggregated in value over twenty million sterling per annum. We are now informed by Dr. Ruston that in 1918 and 1919 these values had exceeded £100,000,000 and £90,000,000 respectively. In the meanwhile how were we faring with our exports? I gather from published statistics that Commonwealth and South Australian exports of bacon and ham may for recent years be summarised as follows:—

Years.	Commonwealth.			South Australia.		
	Quantities. Tons.	Values.		Quantities. lbs.	Values.	
		Total. £	Per lb. d.		Total. £	Per lb. d.
1914-15 . . .	544.2	58,823	11.58	Nil	—	—
1915-16 . . .	248.3	33,583	14.49	Nil	—	—
1916-17 . . .	448.6	60,358	14.41	17	1	14.12
1917-18 . . .	2262.5	321,573	15.22	39	2	12.31
1918-19 . . .	2516.8	378,723	16.11	Nil	—	—

Doubtless since the days of war and of limited shipping facilities some progress in the desired direction appears to have been made by the Commonwealth as a whole; but relatively to the possibilities within our reach and their unavoidable influence on farming progress, we have as yet little to boast of. And are not South Australian figures eloquent of our unenviable position? In support of them, our pig population, which, under the stimulus of dear beef and mutton, had shown temporary increase, is again on the decline, as the following figures will show:—

1914 . . . . .	69,893 head
1915 . . . . .	66,237 "
1916 . . . . .	118,542 "
1917 . . . . .	110,353 "
1918 . . . . .	79,078 "
1919 . . . . .	60,295 "

But great as is our direct loss from inability to export pig products, I am inclined to rate the indirect loss even higher. In my opinion, the stagnation of the pig industry blocks the way to normal progress in general farming, and handicaps our attempts to bring about closer settlement in suitable districts. As to the first point, we are all familiar with the one great characteristic of Australian farming of recent times, namely, the treatment of land as carefully cultivated bare fallow for a period of ten months or so prior to sowing it to wheat. In other words, in our fight for profitable returns, we have found it expedient to forego the productive use of land for alternate twelve-months. Now, however useful and however inevitable this practice may be, it is not altogether without attendant disadvantages. In the first place, it tends to exaggerate the minimum areas of individual farms, and secondly, it loads each wheat crop with two years' rental. It represents, moreover, a phase in agricultural development, through which most countries have been compelled to pass, and which at a later stage the pressure of economic conditions has compelled them to modify. Almost invariably the next step has been the growing of a second cereal crop on the stubbles of the wheat crop, which had itself been preceded by bare fallow; and according to soil and climatic conditions this second crop has usually been oats or barley. Hence, we come to the following normal rotation:—First year, bare fallow; second year, wheat; third year, oats or barley.

That this rotation can be practised satisfactorily in South Australia I demonstrated very clearly whilst in charge of the Roseworthy Agricultural College Farm. I was able to show that on a farm with a 17in. rainfall and a normal average wheat yield of 20bush., an average yield of 30bush. could be depended upon from barley grown as a stubble crop. Hence, I am of the opinion that here, in South Australia, we could each year put under barley or oats hundreds of thousands of acres, which in present circumstances are usually more or less unproductive. And assuming profitable utilisation of these oats and barley, nobody can doubt but that in the circumstances average farm returns would be considerably increased; that a reasonable living could be made from relatively smaller areas; and that to that extent closer settlement would develop from a pious hope into a tangible reality.

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Unfortunately, it is the experience of most of us that these secondary cereals—barley and oats—can be marketed to advantage only on those rare occasions on which local supplies are below the very moderate city requirements, or again in times of prolonged drought. In ordinary times a few surplus acres suffice to glut the market, and ruling prices become depressed to the point of unprofitableness. As a matter of fact, the natural outlet for these secondary grains is through the bodies of live stock; and for barley, pigs are undoubtedly the most profitable customers, *providing always, of course, that they themselves can be marketed to advantage.* In the cases quoted by Dr. Ruston, 1lb. of pork was produced for every 4.2lbs. of barley

fed to pigs, as against 1lb. of beef for every 13lbs. of barley fed to bullocks. Within recent years our area under barley has certainly increased somewhat; total production, nevertheless, has never yet attained to 2½ million bushels, whilst with the greatest ease we could probably produce ten to twenty times as much. Just imagine what 25 million bushels of barley would mean to farmers if profitably marketed through pigs? At a low estimate, it would represent a gross return of five to six million sterling, *i.e.*, five to six times the present value of the total annual output of our dairying industry, inclusive of bacon and ham production.

I have always held that given satisfactory market opportunities, pigs could be kept to advantage on practically every cereal farm in South Australia; and it can now be asserted that our present inability to do so is holding in check the normal development of farming, and to that extent is impoverishing the State. And to an equal degree does the same factor hamper the progress and prosperity of the local dairying industry. What is there that is wrong in the position? Markets for bacon and ham abound, and are eagerly availed of by other countries; on the other hand, our local conditions are exceptionally favorable to the rearing of healthy and well-developed pigs. Nor does our geographical isolation offer any serious hindrance to the profitable export of cured pork. And yet, notwithstanding our crying need of profit-bearing exports, we are content with folded arms to mark time. What can be done to break through this apparent apathy?

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Formerly the Commonwealth export of butter was a negligible quantity; to-day it is worth between four and five million sterling, and in the course of time it will be many times greater. The value of an export trade is mainly dependent on the continuous outflow of a stream of dependable goods, essentially even in quality, and in the matter of butter this was not possible until factories run on industrial lines had been brought into existence. This was brought about mainly by the butter export bonus initiated in Victoria, and adopted subsequently in South Australia. Since those days, apart from drought and war conditions, the dairy industry has never looked back. The position of the pig industry to-day is exactly similar to that of the dairy industry of pre-bonus days. We have no factories of any consequence, and we cannot have an export market without factories; hence, special inducements should be given towards starting these factories, and the simplest inducement is undoubtedly an export bonus operating for a reasonable number of years. Unfortunately, the Federal agreement between the States debar any one State from offering special export bonuses for local industries, and the only alternative is a Commonwealth bonus open to all States alike. Unfortunately, again, the Commonwealth authorities appear difficult to convince, and in the meanwhile our farming interests stagnate and our dairying industry is unnaturally crippled by the loss of one of its main supports.

## DEPARTMENTAL DOINGS.

### AMONG AGRICULTURISTS.

#### AGRICULTURAL CONFERENCES.

Two important functions during the month were the Conferences of Lower Northern and Upper Northern Branches of the Agricultural Bureau, held at Clare and Orroroo respectively. The former, which was a most successful gathering, was attended by the Director of Agriculture (Professor A. J. Perkins), Capt. S. A. White, C.M.B.O.U., Mr. H. Wicks, Mr. George Quinn (Horticultural Instructor), and Mr. H. J. Finnis (Acting Secretary Advisory Board). The Upper Northern Conference suffered severely from the effects of heavy rains, which resulted in floods in the district. As a consequence, many of the delegates were unable to reach Orroroo. This gathering was attended by the Honorable the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), the Director of Agriculture (Professor A. J. Perkins), Capt. S. A. White, C.M.B.O.U., Mr. P. H. Suter (Government Dairy Expert), and Mr. H. J. Finnis (Acting Secretary Advisory Board of Agriculture).

#### ECONOMIC VALUE OF NATIVE BIRDS.

Since his appointment to the Advisory Board of Agriculture, Capt. S. A. White, C.M.B.O.U., has devoted a great deal of his time to visiting Branches of the Agricultural Bureau, and delivering illustrated lectures to members and friends. Capt. White has dealt principally with the economic importance of native birds and their relationship to the agriculturist. During the month, lectures were delivered at Berri, Angaston, Virginia, Orroroo, and Clare.

#### TOBACCO CULTIVATION.

Through the courtesy of the Director of Agriculture of Victoria (Dr. Cameron), South Australia has again been favored by a visit from Mr. Temple A. J. Smith (Tobacco Expert of the Department of Agriculture, Victoria). In company with the Superintendent of Experiments (Mr. W. J. Spafford), the Acting Secretary of the Advisory Board (Mr. H. J. Finnis), and Mr. S. B. Opie, Mr. Smith visited Mount Barker, Ashbourne, Gumeracha, Kenton Valley, and Williamstown. At the first-named place Mr. Smith delivered an illustrated lantern lecture on the cultivation of tobacco. At each of the centres mentioned members of the Agricultural Bureau took the opportunity of inspecting the tobacco plots being conducted in conjunction with the local Branches of the Agricultural Bureau.

#### FARM BUILDINGS, ETC.

Heavy demands have been made by members of the Agricultural Bureau and others on the services of the Field Engineer (Mr. J. Paul). This officer visited Mr. R. Upton, of Coomandook, and advised on the erection of drafting yards and shearing sheds. Messrs. Evans Bros., of Parilla, were supplied with data relating to the construction

of a thousand-gallon reinforced concrete tank. Mr. R. Butterfield, of Lockleys, who is erecting a 100-ton concrete silo, was also supplied with information; and Mr. C. W. H. Basham, of Port Elliot, was visited in reference to the erection of a barn, stables, and chaff-houses. Mr. L. G. Rowe, of Sandilands, was advised on the erection of an implement shed, and Mr. E. E. Gill, Spalding, on reinforced concrete work generally.

#### HORTICULTURE.

Mr. C. H. Beaumont (Horticultural Inspector) visited the Murray Bridge Branch of the Agricultural Bureau, and addressed members on "Fruit Drying in the Sun, and by Means of Evaporators." Mr. Beaumont also inspected the garden attached to the Murray Bridge High School.

#### DAIRYING.

The Assistant Dairy Expert (Mr. H. J. Apps) visited factories and dairies in the Port Elliot, Murray Bridge, Kybybolite, and Berri districts during the month of February.

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## SOME EXPERIMENTS BEARING ON THE RESULTS OF EXPOSURE OF SUPERPHOSPHATE TO ORDINARY WEATHER CONDITIONS.

[By ARTHUR J. PERKINS, Director of Agriculture.]

### INTRODUCTORY.

The reliability of artificial manures, and their correspondence to the seller's guarantee, is a question which touches farmers very closely. Within recent years I have been giving this matter very careful consideration, and have come to the conclusion that in so far as superphosphate is concerned, farmers have been receiving very fair value for their money. Occasionally, it is true, samples are to be met with, the analysis of which falls somewhat below the margin allowed by the Act; the usual inference in such cases is, however, that this is the consequence of faulty manufacturing processes rather than of fraudulent intent. It would seem that manufacturers find it difficult to bring about a thoroughly intimate mixture of the ingredients which enter into the manufacture of superphosphate. Manufacturers are no doubt conscious of this weakness in their manufacturing processes, and in order to protect themselves and their clients against its consequences, supply to the latter far richer mixtures than they guarantee to sell. Within recent years a farmer who has purchased a 36 per cent. superphosphate has received a manure going nearer 40 per cent. than 36 per cent. Cases of unusually low analyses have, however, occasionally—although not recently—come under my notice. In such cases sellers have often repudiated responsibility on the grounds that the bags have in all probability been exposed to the weather either on the farm or on unprotected railway trucks. And it is with the intention of ascertaining the influence of weather conditions in this direction that these experiments have been undertaken.

### DESCRIPTION OF EXPERIMENTS.

Twelve bags of ordinary standard superphosphate (36 per cent. tricalcium phosphate rendered water soluble) were selected on March 1st, 1919, from the ordinary farm supplies. Each bag was opened, and its contents were thrown on a clean floor, on which they were mixed as thoroughly as was found possible. After collecting a sample for analysis, the bags were filled again and carefully weighed. Of these bags, six were stored away on dunnage in a closed shed; the remaining six were placed on dunnage in the open, and thus exposed to all weather conditions. Each of the latter bags was stood on its

end, and so spaced that no one bag was less than 3ft. from its immediate neighbor.

Every two months, *i.e.*, on the first days of May, July, September, November, January, and March, one of the bags under cover and one of those exposed to the weather were taken, weighed, opened out, and their contents thoroughly mixed; finally, a sample from each was taken for analysis.

It will be clear that the result of these successive analyses should serve to give some idea as to the influence of exposure to weather conditions on the general composition of superphosphate. And since nobody in his senses would dream of exposing superphosphate to the mercies of the weather for 12 successive months, we must look upon the results secured as extreme cases, not likely to be approached in every-day practice.

For the sake of completeness, and in order to secure a wider range of experience, these experiments were conducted under exactly the same conditions on four separate Government farms, namely, at Turretfield, representing the Central district; at Veitch, representing the mallee; at Booborowie, representing the Middle North; and at Kybybolite, representing the South-East.

All the analyses were carried out in the laboratory of the Director of Chemistry.

#### INITIAL ANALYSES OF BAGS UNDER EXPERIMENTS.

In Table I. are indicated the initial analyses of samples taken from the 48 bags on March 1st, 1919.

Table I.—*Showing Initial Percentages of Water Soluble Phosphates from Samples taken on March 1st, 1919, expressed both in Terms of Ordinary and of Moisture-free Samples.*

Bag No. Pro- tectd.	Percentage of Ordinary Sample.				Percentage of Moisture-free Sample.			
	Turret- field. %	Veitch. %	Boobo- rowie. %	Kybybo- lite. %	Turret- field. %	Veitch. %	Boobo- rowie. %	Kybybo- lite. %
1 ..	40.3	38.4	43.8	39.5	42.8	41.4	46.0	43.8
2 ..	41.3	38.9	41.9	39.6	43.6	42.4	44.0	43.8
3 ..	41.5	40.7	42.2	40.5	44.1	44.8	44.3	44.6
4 ..	42.3	40.1	41.8	39.8	45.1	43.9	44.1	43.8
5 ..	42.8	38.4	41.9	40.0	45.3	42.1	44.3	44.3
6 ..	42.3	40.4	40.0	39.8	45.5	44.8	42.5	43.9
Ex- posed.	%	%	%	%	%	%	%	%
7 ..	40.0	39.7	41.0	40.0	42.9	43.2	43.8	43.9
8 ..	39.4	38.9	40.2	39.8	42.3	42.8	42.1	43.2
9 ..	41.5	40.0	40.4	38.0	44.4	43.6	42.8	42.5
10 ..	40.0	40.0	44.8	40.0	42.4	43.7	46.9	44.5
11 ..	40.1	41.5	42.0	40.3	42.6	45.5	44.5	45.0
12 ..	41.4	40.2	41.6	39.7	43.7	44.0	44.1	44.1



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In the first place, I shall state that the first half of the table shows the percentages of water soluble phosphates actually found in the phosphates, and corresponding to the usual guarantee of analysis. In the second half the percentages have been calculated to correspond to moisture-free samples. This calculation is, of course, necessary, in view of future comparisons with samples from bags exposed to the weather, and which at times will be in a more or less moisture-sodden condition. In this connection it may be noted that on March 1st, 1919, the mean moisture contents of the various bags were as follows:—

Turretfield . . . . .	6.05 per cent. of moisture
Veitch . . . . .	8.61 “ “
Booborowie . . . . .	5.28 “ “
Kybybolite . . . . .	9.60 “ “

Next, I shall state that of the 48 bags under experiment, 36 of them (Turretfield, Veitch, and Kybybolite) were of one and the same brand, which I shall call Brand A; and 12 of them (Booborowie) of another brand, which I shall call Brand B. Both brands were sold under the 36 per cent. guarantee of analysis; and, as may be seen from the table, notwithstanding irregularities in moisture contents, in every case the guarantee was considerably exceeded. At Turretfield the mean for the 12 bags was represented by 41.1 per cent., at Veitch by 39.8 per cent., and at Kybybolite 39.8, representing a general average for Brand A of 40.3 per cent.; whilst for Brand B the mean average was 41.8 per cent. at Booborowie. Farmers must agree that so long as they are supplied with manures of this calibre they can have nothing to complain of.

But if these manures are remarkable for their high percentages, they are equally so for the irregularity of these percentages. Irregularity in moisture contents will account for this in some slight degree. In the main, however, it must be attributed to faulty mixing in the manufacturing process. In 36 bags of Brand A we find variations of 38 per cent. to 42.8 per cent., or a difference between extremes of 4.8 per cent.; and in 12 bags of Brand B, variations of 40 per cent. to 44.8 per cent., or again a difference of 4.8 per cent. Unfortunately, these differences between bag and bag may be suspected to extend to the material within individual bags; and notwithstanding our endeavor to mix before sampling, it is to be feared that the irregularity of the material has in some cases affected the results of some of the analyses.

#### SUBSEQUENT ANALYSES OF SAMPLES UNDER EXAMINATION.

As has been stated, on each farm the bags were subsequently sampled, and the samples analysed every other month between March,

1919, and March, 1920. I have summarised the results in Table II. below, in which water soluble phosphates are given in terms of the moisture-free sample.

*Table II.—Showing Results of Analysis of Superphosphates in Terms of Moisture-free Samples from March 1st, 1919, to March 1st, 1920.*

			Exposed.		Protected.		
			Mar. 1, 1919.	Difference	Mar. 1, 1919.	Difference	
TURRETFIELD.							
1919.	%	%	%	%	%	%	%
May 1st . . . . .	43.4	42.9	+0.05	41.2	42.8	-1.6	
July 1st . . . . .	42.3	42.3	—	43.0	43.6	-0.6	
September 1st . . . . .	47.7 (†)	44.4	+3.3 (†)	43.4	44.1	-0.7	
November 1st . . . . .	38.6	42.4	-3.8	42.3	45.1	-2.8	
1920.							
January 1st . . . . .	39.4	42.6	-3.2	42.7	45.3	-2.6	
March 1st . . . . .	41.1	43.7	-2.6	43.7	45.5	-1.8	
VEITCH.							
1919.							
May 1st . . . . .	44.6	43.3	+1.3	42.5	41.4	+1.1	
July 1st . . . . .	41.6	42.8	-1.2	42.1	42.4	-0.3	
September 1st . . . . .	42.7	43.6	-0.9	43.4	44.8	-1.4	
November 1st . . . . .	43.0	43.7	-0.7	43.2	43.9	-0.7	
1920.							
January 1st . . . . .	42.9	45.5	-2.6	41.3	42.1	-0.8	
March 1st . . . . .	42.2	44.0	-1.8	43.3	44.8	-1.5	
BOOBOROWIE.							
1919.							
May 1st . . . . .	45.1	43.8	+1.3	44.5	46.0	-1.5	
July 1st . . . . .	42.6	42.1	+0.5	44.8	44.0	+0.8	
September 1st . . . . .	42.3	42.8	-0.5	44.4	44.3	+0.1	
November 1st . . . . .	44.6	46.9	-2.3	44.1	44.1	—	
1920.							
January 1st . . . . .	40.1	44.5	-4.4	41.9	44.3	-2.4	
March 1st . . . . .	40.3	44.1	-3.8	43.9	42.5	+1.4	
KYBYBOLITE.							
1919.							
May 1st . . . . .	44.6	43.9	+0.7	44.4	43.8	+0.6	
July 1st . . . . .	40.8	43.2	-2.4	43.8	43.8	—	
September 1st . . . . .	39.6	42.5	-2.9	44.0	44.8	-0.8	
November 1st . . . . .	44.7	44.5	+0.2	44.8	43.8	+1.0	
1920.							
January 1st . . . . .	41.5	45.0	-3.5	43.4	44.3	-0.9	
March 1st . . . . .	37.9	44.1	-6.2	42.3	43.9	-1.6	
MEANS.							
1919.							
May 1st . . . . .	44.4	43.5	+0.9	43.2	43.5	-0.3	
July 1st . . . . .	41.8	42.6	-0.8	43.4	43.4	—	
September 1st . . . . .	43.1	43.3	-1.5	43.8	44.5	-0.7	
November 1st . . . . .	42.7	44.4	-1.7	43.6	44.2	-0.6	
1920.							
January 1st . . . . .	41.0	44.4	-3.4	42.3	44.0	-1.9	
March 1st . . . . .	40.4	44.0	-3.6	43.3	44.2	-0.9	

I shall state in the first place that some of the results in Table II., which are unexpected, are probably due to faulty sampling of material, itself somewhat irregular in composition. This is certainly the case for the Turretfield September sample taken from an exposed bag, and which has been marked in the table with a note of interrogation. This particular result has not been included in the calculated mean results shown at the end of the table.

In summary, we see that 12 months' exposure to the weather has resulted in a mean loss of 3.1 per cent. of water soluble phosphate, calculated on a moisture-free sample, with a maximum of 6.2 per cent. at Kybybolite, the wettest of the four stations. It must be admitted, however, that the season was singularly unfitted to determine maximum possible losses. Winter and spring rains were unusually light and scanty, and the main losses appear to have arisen in connection with heavy summer downpours. The rainfall recorded between the dates of sampling was as follows:—

	Turretfield.	Veitch.	Booborowie.	Kybybolite.
	In.	In.	In.	In.
1919.				
March-April . . . . .	0.12	0.62	1.40	0.90
May-June . . . . .	2.96	2.25	4.67	3.62
July-August . . . . .	2.25	0.62	3.37	3.29
September-October . . . .	2.64	1.21	3.53	4.17
November-December . . . .	1.45	2.65	2.63	1.11
1920.				
January-February . . . . .	0.19	0.10	0.22	0.15
12 months' total . . . . .	9.61in.	7.45in.	15.82in.	13.24in.

It will be noted, too, that the loss of water solubility by ordinary reversion is represented by about 1 per cent. after 12 months' storage under cover.

#### GENERAL CONCLUSIONS.

From the above facts we may, I think, conclude that when bags of superphosphate are accidentally exposed to the weather, either on railway trucks or on the farm, the loss of soluble material is not as great as is usually supposed. Apart from caking of the material, and subsequent sowing difficulties, superphosphate will not suffer very materially from occasional showers. Nor when an appreciable difference between the composition of the manure and the guaranteed analysis can be shown to exist is it reasonable to assume that this difference must have been due to careless storage. Finally, the irregularity of some of the results and the general trend of the analyses indicate clearly that superphosphate is not as yet a perfectly homogeneous mixture, and that even in one and the same bag it is exceedingly difficult to secure a representative sample. Nothing that has been said, however, should be used as justification for careless storage, either on railway or on the farm.

## ROSEWORTHY AGRICULTURAL COLLEGE HARVEST REPORT, 1920-1921.

[By W. J. COLEBATCH, B.Sc., M.R.C.V.S., Principal of Roseworthy  
Agricultural College.]

The past season will live in the memories of all who participated in the College harvest as one of exceptionally heavy yields, and it may be some consolation to those whose powers of endurance have been so sorely tried to know that the total amount of produce harvested was 33 tons in advance of the 1,465 ton record established in 1915. If cognisance be taken of all produce carted from the fields throughout the year, the total produce obtained is found to be, approximately, 1,630 tons; this figure is inclusive of all succulent foliage raised under a system of partial irrigation, but does not embrace the mountains of valuable cocky chaff and cavings that surround the tail of the thresher.

Whilst referring to the subject of total yields it is as well to compare the 1920 season with other years of bounty experienced on the College holdings.

In Table I. are given the grain and hay yields of all seasons in which the total grain harvest at the College has exceeded 10,000 bushels.

TABLE I.—*Showing Records of Production in Hay and Grain for 1920,  
Comparatively with all Other Years in which 10,000 Bushels  
of Grain were Garnered:—*

Year.	Wheat. Bush.	Barley. Bush.	Oats. Bush.	Rye. Bush.	Pease. Bush.	Total Grain. Bush.	Hay. Tons.
1917 . . . . .	6,586	5,235	305	30	784	12,940	153
1920 . . . . .	9,511	2,267	1,013	55	—	12,846	711
1909 . . . . .	8,239	2,364	1,022	—	—	11,895	404
1916 . . . . .	8,658	1,576	174	27	352	10,787	375
1908 . . . . .	5,751	4,170	470	—	—	10,391	293

The above figures serve to show that, although the 1917 yield of total grain was 94 bushels above that of 1920, in the latter year 711 tons of hay were harvested as against 153 tons. Further, the 1920 wheat harvest exceeded by 853 bushels the next highest total, namely, 8,658 bushels gained in 1916.

The total area under crop in 1920 was 865 acres, but from this must be deducted the pease, rape, and other forage crops that were grazed

off. The balance thus obtained, namely, 800 acres, represents the area from which the results set out in this report were secured. In order that the high standard attained by the 1920 crops may be clearly brought out, I have shown these yields in comparison with the corresponding mean returns in the appended table:—

TABLE II.—*Showing Crop Returns for 1920 Comparatively with the Mean Yields.*

Crop.	Period.	Mean Yield.		Average Yield, 1920.		
		Bush.	lbs.	Bush.	lbs.	
Wheat . . . . .	1904/20	17	50	26	57	
Barley . . . . .	1904/20	28	25	21	30	
Oats . . . . .	1905/20	26	16	29	37	
Rye . . . . .	1909/20	11	49	14	10	
Hay . . . . .	1904/20	T. 2	C. 0	L. 98	T. 2	C. 10
Ensilage . . . . .	1905/20	6	12	34	7	11
Berseem . . . . .	1912/20	29	12	89	28	15
					48	

The outstanding feature of this series of averages is the 1920 wheat yield, which is 1bush. and 52lbs. above the previous record of 25bush. 5lbs. per acre established in 1909. As will be shown later, the average return from the farm crops was actually 30bush. per acre, but several of the experimental blocks fell back to 5 bags or 6 bags, and this reduced the general average to, approximately, 27bush. It must be remembered also that this very pleasing record was established over a total of 341.542 acres, an area which has only twice been exceeded in the last 17 years.

That the barley average is below the mean is to be explained by the losses sustained in handling, through the crop having to lie in the stook awaiting its turn at the thresher. The only other instance in which the mean yield surpasses the 1920 return is in regard to Berseem clover, and this is attributable solely to the dwindling water supply.

#### THE WEATHER.

In years of light rainfall the success or failure of cereal crops is determined mainly by the rainfall registered in the preceding summer, and the extent to which it has been conserved by judicious tillage. When copious showers in the winter are followed up by useful falls in September and October, the character of the fallow rains is a matter of secondary importance, and if these spring rains are followed by moist, cool weather during November, even the mid-season varieties are able to furnish their grains and yield plump samples, notwithstanding the fact that the fallow rains were light and scanty.

These are virtually the conditions under which the 1920 crops were raised, and it is significant of the wonderful distribution of the rainfall that the record harvest should have been gained from fallows that received nearly 2½in. less rain than the mean corresponding fall for the past 15 years. By way of indicating the condition of the fallows at the close of the summer, I submit particulars regarding fallow rains in the following table:—

TABLE III.—*Showing Fallow Rains, August 1st of one year to March 31st of Succeeding Year, Together with the Corresponding Mean for 37 Years, 1883-1919:—*

Season.	In.	Season.	In.
1904/1905 . . . . .	7.18	1912/1913 . . . . .	13.00
1905/1906 . . . . .	7.96	1913/1914 . . . . .	13.07
1906/1907 . . . . .	11.29	1914/1915 . . . . .	3.86
1907/1908 . . . . .	9.13	1915/1916 . . . . .	9.08
1908/1909 . . . . .	9.51	1916/17 . . . . .	14.79
1909/1910 . . . . .	17.56	1917/1918 . . . . .	10.83
1910/1911 . . . . .	11.41	1918/1919 . . . . .	5.45
1911/1912 . . . . .	5.88	1919/1920 . . . . .	7.27
Means . . . . .		1883/1919 . . . . .	9.72

In total rainfall the year 1920 will compare favorably with the normal annual precipitation as calculated from the records of the previous 37 years. Indeed, from the point of view of cereal growing, a total of 19.3in. is really more favorable than the very wet years, provided the distribution be approximately similar to that of the mean annual fall. For purposes of comparison the total fall of the five years immediately preceding 1920 are given in the succeeding table of monthly and annual rainfalls.

TABLE IV.—*Showing Monthly Rainfall at Roseworthy College for Seasons 1915-1920, Inclusive, with the Mean Fall for each Month During the Period 1883-1919.*

	1915.	1916.	1917.	1918.	1919.	1920.	Means, 1883-1919.
	In.	In.	In.	In.	In.	In.	In.
January . . . . .	0.81	1.15	0.58	0.24	0.28	0.27	0.77
February . . . . .	0.04	0.16	2.12	0.26	2.50	0.00	0.62
March . . . . .	0.30	0.62	0.96	0.88	0.00	0.86	0.85
April . . . . .	1.95	1.36	0.68	0.83	0.24	0.69	1.57
May . . . . .	3.01	0.88	3.98	2.55	1.49	1.47	1.80
June . . . . .	4.61	5.18	2.17	1.22	1.07	4.44	2.59
July . . . . .	1.89	2.75	1.92	1.36	0.66	1.12	1.82
August . . . . .	1.83	3.00	2.60	1.83	2.00	3.01	2.08
September . . . . .	3.56	1.82	3.00	0.48	1.87	1.62	1.81
October . . . . .	1.27	1.65	1.72	1.88	0.83	2.53	1.65
November . . . . .	0.21	3.61	1.18	0.38	0.05	1.88	1.08
December . . . . .	0.28	1.05	0.95	0.10	1.39	1.41	0.80
Totals . . . . .	19.76	23.23	21.86	12.01	12.38	19.30	17.41

By reference to the last two columns in the above table it will be seen that during the first four months only 1½ in. were measured, whereas in a normal season over 3½ in. would be recorded. The May fall was also below the average, although the greater part of the 142 points recorded on June 1st actually fell on May 31st. This heavy downpour was actually the first heavy soaking the land received, and whilst the scarcity of rain allowed seeding to proceed without serious interruption, the possibility of a dry June led to the holding up of work in connection with varieties, the seed of which could not be replaced in the event of failure. The only other period of the year that caused anxiety was the hot, rainless month that elapsed between September 9th and October 11th. Another week or ten days of this intense dry heat would have damaged beyond recovery the late ripening wheats and the early hay crops.

The remarkably favorable distribution of the rain that fell during the year is shown in Table V., wherein it is made apparent that no less than 86.84 per cent. of the total rainfall may be classed as "useful."

TABLE V.—*Showing the Distribution of "Useful Rain" in the Years 1915-1920 Inclusive, Together with the Means for the Previous 37 Years.*

	Seeding Rains. April-May.	Winter Rains. June-July.	Spring Rains. Aug.-Oct.	Summer Rains. November.	Totals.	Percentage of "Useful" to Total Rain.
	In.	In.	In.	In.	In.	In.
1915 . .	4.96	6.50	6.66	0.21	18.33	92.76
1916 . .	2.24	7.93	6.47	3.61	20.25	87.17
1917 . .	4.66	4.09	7.32	1.18	17.25	78.91
1918 . .	3.38	2.58	4.19	0.38	10.53	87.68
1919 . .	1.73	1.73	4.70	0.05	8.22	66.40
1920 . .	2.16	5.56	7.16	1.88	16.76	86.84
1883-1919	3.40	4.38	5.51	1.06	14.35	82.42

In addition to the rainfall we have to consider the effects of frosts, humidity, storms, and hot scorching winds upon the farm fields. Even in years of good rainfall, yields may be spoilt by inclemency of the weather at critical stages. In this respect, however, the 1920 crops were also fortunate. It is true that 19 frosts were recorded, but whilst these were not without effect on the vines they caused little if any damage to field crops.

The weather during the ripening period was distinctly cooler than usual, but we experienced very few days of oppressive, muggy heat, and consequently the crops were able to move steadily along towards full maturity without having to contend against red rust and other parasitic fungi, as is frequently the case when October, November, and



the early part of December are marked by relatively low temperatures. The salient features of the season are shown in summary in the following table:—

TABLE VI.—*Showing Particulars of Weather Experienced at Roseworthy College in 1920.*

[illegible]

## WINTER GREEN FEED.

A reliable winter growing forage crop is invaluable for dairy cattle where pasturage is at times scanty and uncertain. Berseem clover, which is capable of rapid growth at comparatively low temperatures, provides the type of plant desired, and if properly managed it may be confidently expected to yield from 25 to 35 tons of succulent.

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8/9/20  
Signed—F. W. FLAVEL, Charlton, Port Lincoln."

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MILE END.**

Less 2½ per cent. for Cash Settlement.

No.	Capacity per hour, Gallons.	By P/N at Three Months, as per Contract.
00	10	6 15 0
0	15	9 0 0
1	27	14 0 0
2	50	25 10 0
3	82	38 0 0
4	115	42 0 0

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terms on application.

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**EXTRACTS FROM LETTERS RECEIVED.**

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nutritious, and palatable provender per acre. The important facts connected with Berseem culture are:—

## ENSILAGE CROPS.

Owing to the low pressure in the main supplying the irrigation blocks during the summer months we are compelled to rely entirely on autumn sown crops to fill the silos. It will happen occasionally, when summer showers occur, that sorghum and maize crops can be helped along sufficiently to furnish a means of replenishing our supplies, but fortuitous circumstances of this kind are much too rare to warrant a dairy farmer in these regions in neglecting to make ample provision for the summer and autumn during the preceding spring. Apart from irrigable areas, dairying is only possible and profitable in districts with limited rainfall when autumn sown cereals are cut in the spring and chaffed into silos in sufficient quantities to carry the dairy herd over till the autumn grass is well up. Ensilage may have to be fed as early as November, and in late seasons the practice may require to be continued till May or even June.

This means that for a herd of 20 cows approximately 100 tons of silage should be conserved, and it will require on the average about 15 acres or 16 acres of cereal crop to meet this demand. As a rule it is the most forward of the crops that is chosen, as it is important to conclude silage cutting before the early fields are ripe enough for hay making. In this instance proximity to the farm and vigorous development of crop led us to select a crop of Cape barley, although other things being equal, preference should be given to either wheat or oats for this purpose.—The crop was grown in Field No. 6c, the earlier history of which is as under:—

1895 . . . . .	Oats.	1907 . . . . .	Barley.
1896 . . . . .	Pease.	1908 . . . . .	Pasture.
1897 . . . . .	Wheat.	1909 . . . . .	Bare fallow.
1898 . . . . .	Pasture.	1910 . . . . .	Wheat, oats, rye.
1899 . . . . .	Bare fallow.	1911 . . . . .	Kale, rape.
1900 . . . . .	Wheat.	1912 . . . . .	Bare fallow.
1901 . . . . .	Pasture.	1913 . . . . .	Oats and lucerne.
1902 . . . . .	Bare fallow.	1914-16 . . . .	Pasture.
1903 . . . . .	Wheat.	1917 . . . . .	Bare fallow.
1904-5 . . . . .	Pasture.	1918 . . . . .	Wheat, lucerne.
1906 . . . . .	Bare fallow.	1919 . . . . .	Bare fallow.

Fallowing did not take place till September, and the field received but two cultivations prior to seeding operations. In April it was scarified and drilled with superphosphate (2cwts. per acre) and Short Head barley (1½bush. per acre), the work being completed by the twentieth of the month.

The crop was harvested at the end of September, and an area of 18.464 acres had to be cut before the 140 tons required to fill the pits was obtained. The average yield per acre, namely, 7 tons 11cwts. 109lbs., is more than a ton to the acre better than the mean return

for the preceding 14 years, and over  $5\frac{1}{2}$  tons in advance of the 1919 yield. From the following tables it will be observed that the normal yield of green cereal cut when in the transition stage between the "milk" and the "dough" is slightly more than  $6\frac{1}{2}$  tons per acre.

TABLE IX.—*Showing Yields of Ensilage, 1905-1920.*

Year.	Rainfall.		Area. Acres.	Total Yield.			Yield per Acre.
	"Useful."	Total.		T.	C.	L.	
1905 .....	14.23	16.71	—	—	—	—	8 10 0
1906 .....	16.31	19.73	9.50	113	1	0	11 13 6
1907 .....	13.96	15.13	17.15	92	2	75	5 7 34
1908 .....	15.52	17.75	17.00	129	10	76	7 12 44
1909 .....	21.15	24.05	16.962	169	18	90	10 0 3
1910 .....	16.79	23.87	15.490	134	1	43	8 15 32
1911 .....	9.45	13.68	30.740	152	16	28	4 19 47
1912 .....	13.05	14.97	40.700	141	4	73	3 9 45
1913 .....	10.82	15.66	61.511	115	14	24	1 17 70
1914 .....	6.12	9.36	—	—	—	—	—
1915 .....	18.33	19.76	27.384	153	14	107	5 12 33
1916 .....	20.25	23.23	12.443	103	11	28	8 6 51
1917 .....	17.25	21.86	9.176	77	18	84	8 9 28
1918 .....	10.53	12.01	19.284	91	15	75	4 15 21
1919 .....	8.22	12.38	59.436	116	12	101	1 19 28
1920 .....	16.76	19.30	18.464	140	6	8	7 11 109
Means, 1905-1920 .....							6 12 34

TABLE X.—*Showing Quantity of Crop Cut for Silage per Ball of Twine Used, 1915-1920.*

Year.	Area Acres.	Total Yield.			Acre Yield.			Weight of Crop Cut.
		T.	C.	L.	T.	C.	L.	
1915 .....	27.384	153	14	107	5	12	33	4 7 55
1916 .....	12.443	103	11	28	8	6	51	4 16 38
1917 .....	9.176	77	18	84	8	9	88	4 14 52
1918 .....	19.284	91	15	75	4	15	21	3 11 32
1919 .....	59.436	116	12	101	1	19	28	3 0 23
1920 .....	18.464	126	2	96	7	11	109	4 13 60
Average .....					6	2	55	4 3 99

### THE HAY HARVEST.

Advantage was taken of a favorable hay-growing season to fill up the hay barns and provide a surplus against dry years. The total amount hauled over the weighbridge was 710 tons 18cwt. 4lbs., and it is satisfactory to be able to record that every sheaf was under cover or in the stack before Christmas. This is the second largest hay harvest in the history of the College farm, and it stands in striking contrast to the one immediately preceding it, inasmuch as the area cut was 283.064 acres, whereas in 1919 only 280 tons were obtained from 298.76 acres. The average yield per acre was not exceptionally high, being a few pounds above  $2\frac{1}{2}$  tons; but, although this falls appreciably below the

3-ton yields obtained in 1905 and 1916, it shows to advantage when compared with the mean average yield for the past 17 years, namely, 2 tons 98 pounds. In comparing these yields it should not be overlooked that the figures for 1920 refer to a larger tonnage than the other two years put together. At one period I had hoped that the acre-yield would eclipse all previous records; but the hot, dry weather that followed hard upon the Adelaide Show reacted severely on our hay crops, and the early wheats, which occupied all but 17½ acres of the hay area, never properly recovered from it. The mid-season variety—Early Crossbred 53—which was not so far advanced, responded to the October rains, and yielded at the rate of 3 tons 4cwt. 71lbs.; but varieties like King's White, King's Red, and their beardless derivatives, namely, Sultan, President, Felix, and Caliph, were too near the hay-cutting stage to be benefited, except to the extent that the drying up of the leaves and stems was arrested, and further losses through this cause prevented. Notwithstanding this threatening period, however, the past year must be ranked amongst the most successful the College has yet experienced in the matter of haygrowing. This will be sufficiently obvious if reference is made to the appended table setting out the hay returns from 1904 to 1920:—

TABLE XI.—*Showing Average Hay Yields on the College Farm, 1904-1920.*

Year.	Rainfall.		Area Acres.	Total Yield.			Average Yield.		
	"Useful" Inches.	Total Inches.		T.	C.	L.	T.	C.	L.
1904 . . . . .	11.60	14.70	93.000	238	0	0	2	11	22
1905 . . . . .	14.23	16.71	67.000	198	8	22	3	2	71
1906 . . . . .	16.31	19.73	93.000	241	0	0	2	11	90
1907 . . . . .	13.96	15.13	51.000	91	14	20	1	15	108
1908 . . . . .	15.52	17.75	112.800	293	6	23	2	7	5
1909 . . . . .	21.15	24.05	145.397	404	4	54	2	15	68
1910 . . . . .	16.79	23.87	94.900	224	7	6	2	7	31
1911 . . . . .	9.45	13.68	200.100	290	12	94	1	8	6
1912 . . . . .	13.05	14.97	248.450	432	7	49	1	14	90
1913 . . . . .	10.82	15.66	258.200	207	7	111	0	16	7
1914 . . . . .	6.12	9.36	247.647	181	13	107	0	14	75
1915 . . . . .	18.33	19.76	341.649	806	7	36	2	7	23
1916 . . . . .	20.25	23.23	121.727	374	17	8	3	1	66
1917 . . . . .	17.25	21.86	74.580	153	2	81	2	1	6
1918 . . . . .	10.53	12.01	82.144	126	19	47	1	10	102
1919 . . . . .	8.22	12.38	298.760	280	16	48	0	18	90
1920 . . . . .	16.76	19.30	283.064	710	18	4	2	10	26
Average for 17 years . . . . .							2	0	98

The mean average yield shown in the above table is calculated from the total area cut for hay, and in this are included all the headlands, divisions between plots, discarded varieties, and the balance of the barley crop grown for ensilage. Even one of the hay fields—No. 6A—was originally set apart for rape, and only sown for hay at

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the last moment. The details of the 1920 hay harvest are summarised below:—

TABLE XII.—*Summary of 1920 Hay Returns.*

Field.	Area. Acres.	Total Yield.			Acre Yield.		
		T.	C.	L.	T.	C.	L.
Day's . . . . .	135.877	327	9	92	2	8	23
Daly's A . . . . .	50.517	152	0	10	3	0	20
No. 6A . . . . .	37.695	96	10	15	2	10	95
Totals . . . . .	224.089	576	0	5	2	11	46
Headlands . . . . .	58.975	134	17	111	2	5	84
Grand Totals . . . . .	283.064	710	18	4	2	10	26

## DAY'S A.

This field forms portion of a property acquired in 1919. At the time of purchase it was carrying a hay crop, and for several seasons prior to that it had been cropped in alternate years. The soil is light in character, and there is abundance of limestone on the surface. With the exception of a small block of hay stubble which a rearrangement of fences brought inside its boundaries, the whole field was fallowed up in August, and worked over in October and January. Immediately prior to seeding it was cultivated again, and between May 17th and 22nd sown with 2cwts. of 36/38 grade superphosphate and 2bush. of the undermentioned varieties of wheat per acre:—

TABLE XIII.—*Hay Yields of Wheats Grown in Day's A, 1920.*

Variety.	Selection.	Area. Acres.	Total Yield.			Acre Yield.		
			T.	C.	L.	T.	C.	L.
Early Crossbred 53 . . . . .	3	17.480	56	9	82	3	4	71
Sultan . . . . .	1	17.557	49	14	102	2	16	75
Felix . . . . .	1	19.278	46	10	110	2	8	33
King's White . . . . .	12	29.338	66	6	18	2	5	23
President . . . . .	1	9.601	20	14	52	2	3	19
King's Red . . . . .	12	30.048	64	10	40	2	2	106
Caliph . . . . .	3	10.710	17	10	110	1	12	86

In justice to the variety Caliph—which is a cross between King's White and Marshall's No. 3—it must be clearly stated that the land on which it grew carried a wheaten hay crop in 1919. All the other varieties, with the exception of a small margin along the block of President, were on fallowed land. In our experience, when given an equal opportunity, Caliph has proved to be little, if any, inferior to King's White or King's Red as a hay yielder, and it is rather creditable than otherwise that it should have returned nearly 33cwt. of hay from autumn ploughed stubble in this field. Another point to be observed in this statement of yields is the superiority of Sultan and Felix over King's White and King's Red. These two wheats, and also President, are beardless varieties, bred from half-bred King's Early types. They represent the result of several years' work, and



it is encouraging to find that in our efforts to embody in a beardless wheat the many good qualities of King's White and King's Red, the all-important capacity to yield a heavy tonnage has not been sacrificed. This is the first season in which the hay-yielding powers of these new varieties have been tested over relatively large areas in a comparative test with standard hay wheats, and consequently I do not feel free to advance the opinion that they are an improvement on King's White or King's Red as producers of hay; but the results shown this year, and in smaller plots in the preceding season, provide ample justification for urging farmers to give them a trial. President is the latest in ripening, and Felix the earliest; but it is not claimed that any of them are quite as quick to mature as King's Red and King's White.

The strain of Crossbred 53, which gave such an excellent account of itself in this field, is a selection made by Mr. R. C. Scott, Experimentalist, and in this district it is found to complete its growth and development a fortnight or so earlier than the ordinary variety. It does not differ in general character from the ordinary type, and hence the name has not been changed, but the prefix "Early" has been attached to distinguish it.

#### DALY'S A.

##### *Previous History.*

1912 . . . . .	Bare fallow.	1917 . . . . .	Pasture.
1913 . . . . .	Wheat.	1918 . . . . .	Pease.
1914 . . . . .	Bare fallow.	1919 . . . . .	Barley.
1915 . . . . .	Kale.	1920 . . . . .	Wheat (Hay).
1916 . . . . .	Wheat.		

It is contrary to all the accepted principles underlying the theory of crop rotation to follow barley with wheat. However, circumstances were abnormal in this instance, inasmuch as the barley crop was a comparative failure, and, for the most part, was grazed off. Further, the barley was preceded by a pea crop that was also grazed, and as the land was lying out for 12 months prior to this, the interval between white-strawed crops was virtually four years. It was rightly concluded that the soil would be in good heart, and well able to support a vigorous and weighty growth of hay. The grazed barley stubble was disc ploughed and cultivated in April, heavily rolled in May, recultivated and drilled with 2cwt. of 36/38 grade superphosphate and 2bush. of King's White (Selection 12) between May 21st and May 24th. The crop flourished from the start, and appeared to be less affected by the dry September weather than other fields of similar types of wheat. It proved to be the most even crop we have yet grown on this block, the soil of which is far from uniform. The

rough weather in October drove portions of it down, and some difficulty was experienced in binding it; but, nevertheless, the return per acre worked out at the very satisfactory average of 3 tons 20lbs.

## FIELD No. 6A.

*Prior History.*

1895 . . . .	Oats.	1908 . . . .	Barley.
1896 . . . .	Pease.	1909 . . . .	Bare fallow.
1897 . . . .	Wheat.	1910 . . . .	Wheat, barley.
1898 . . . .	Pasture.	1911 . . . .	Maize, sorghum.
1899 . . . .	Bare fallow.	1912 . . . .	Wheat, oats sainfoin.
1900 . . . .	Wheat.	1913 . . . .	Pasture.
1901 . . . .	Pasture.	1914 . . . .	Pasture.
1902 . . . .	Bare fallow.	1915 . . . .	Fallow.
1903 . . . .	Wheat.	1916 . . . .	Wheat.
1904 . . . .	Pasture.	1917 . . . .	Fallow.
1905 . . . .	Bare fallow.	1918 . . . .	Oats.
1906 . . . .	Wheat and oats.	1919 . . . .	Pease.
1907 . . . .	Kale, turnips.		

The pea crop in 1919 was fed off with sheep, and in March the surface was loosened with a disc cultivator in preparation for a crop of rape. After a stroke of the harrows dwarf Essex rape, at the rate of 5lbs. per acre, together with the normal cereal dressing of superphosphate was drilled in, the work being completed on March 24th. The seed did not germinate evenly, and it was ultimately decided to graze the rape off and use the field for a trial of different wheats as hay crops. In the second week of June the surface was again disc-cultivated, and by the 26th of that month the field had been sown with lewt. of standard superphosphate and 2bush. of seed wheat, according to the appended schedule:—

TABLE XIV.—*Hay Yields of Wheats Grown in Field No. 6A, 1920.*

Variety.	Area. Acres.	Total Yield.			Acre Yield.		
		T.	C.	L.	T.	C.	L.
Sultan . . . . .	5.010	14	17	16	2	19	35
Early Gluyas . . . . .	4.842	12	17	6	2	13	10
King's White . . . . .	4.699	12	8	49	2	12	97
Faun . . . . .	0.995	2	12	16	2	12	45
King's Red . . . . .	21.678	51	17	26	2	7	95

Once again the variety Sultan has exhibited a capacity to yield hay at a heavier rate than either King's White or King's Red. It is also noteworthy that King's White is again ahead of King's Red, the difference being almost exactly 5cwt. in favor of the former. Gluyas would probably not find favor with farmers for hay-growing on account of its brown chaff and the willowy character of its growth. In my view, however, color is a matter of minor importance except in so far as it may be an index to quality and color imparted by the presence of bronzed glumes should not be regarded with disfavor. The tendency

to droop is certainly against Gluyas, but when sown thicker it certainly appears to stand better, and in any case it is usually after the heads become heavy with ripening grain that this variety goes down beyond recovery. It is also in its favor that the straws are fine in quality and solid or semi-solid in section; this latter point probably accounts largely for the high returns obtained with this variety, namely, 2 tons 13cwts. 10lbs. Faun is a new crossbred, and was produced by crossing Anvil (King's White  $\times$  Jonathan) with Late Gluyas. It is a beardless white chaffed wheat, rivalling in earliness King's Early and Gluyas.

#### THE AMOUNT OF HAY CUT PER BALL OF BINDER TWINE.

TABLE XV.—*Showing the Relation between a Ball of Binder Twine and the Amount of Hay Cut for the Period 1911-1920.*

Year.	Area Acres.	Yield per Acre.			No. of Balls.	Hay cut per Ball.		
		T.	C.	L.		T.	C.	L.
1911 . . . . .	200.100	1	8	6	120½	2	6	65
1912 . . . . .	237.223	1	14	90	200½	2	0	54
1913 . . . . .	228.909	0	16	6	108	1	14	3
1914 . . . . .	232.406	0	14	78	85	2	0	17
1915 . . . . .	341.649	2	7	23	406	1	19	81
1916 . . . . .	121.727	3	1	66	166½	2	5	3
1917 . . . . .	74.580	2	1	6	94	1	12	65
1918 . . . . .	82.144	1	10	102	65½	1	18	86
1919 . . . . .	298.760	0	18	90	139½	2	0	21
1920 . . . . .	283.064	2	10	26	323½	2	3	110
Average for 10 years . . . . .		1	14	38	—	2	0	17

(To be continued.)

#### IMPORTS AND EXPORTS OF FRESH FRUITS, PLANTS, ETC.

During the month of January, 1921, 5,434bush. of bananas, 272bush. of fresh fruits, 18 packages of bulbs, 10 packages of plants, 30 packages of seeds, and 1,659 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 288bush. of bananas (over-ripe), and 1 case of grapes (prohibited entry) were destroyed.

Under the Federal Commerce Act, 1,517 packages of dried fruit, 2 packages of preserved fruit, 4 packages of jam, and 1 package of honey were exported to oversea markets. These were consigned as follows:—For London—1,267 packages of dried fruit, 1 package of honey, 2 packages of preserved fruit, and 4 packages of jam. For Vancouver—250 packages of dried fruit.

Under the Federal Quarantine Act, 690 packages of seeds, &c., were examined and admitted from oversea sources. Of these, 1 package (10lbs.) of rye grass was destroyed on account of the presence of proclaimed weed pest, *Thlaspi arvense*.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

### CONFERENCE OF LOWER NORTHERN BRANCHES.

The Annual Conference of Lower Northern Branches of the Agricultural Bureau was held at Clare on Wednesday, February 9th. Representatives were present from the Blyth, Watervale, Williamstown, Lyndoch, Two Wells, Saddleworth (men and women's), and Clare Branches. The Department of Agriculture was represented by the Director (Professor Arthur J. Perkins), the Horticultural Instructor (Mr. Geo. Quinn), the Dairy Expert (Mr. P. H. Suter), Capt. S. A. White, Messrs. F. Coleman, T. Wicks, and H. J. Finnis (Acting Secretary) of the Advisory Board of Agriculture.

Under the Presidency of Mr. M. Nolan, proceedings opened with the National Anthem. Capt. S. A. White, C.M.B.O.U., then formally opened the Conference.

#### SEED WHEAT.

The first subject considered was "The importance of using clean seed," introduced in a paper by Mr. A. L. McEwin, a veteran agriculturist and member of the Blyth Branch. He forcefully urged the wisdom of sowing nothing but properly cleaned wheat, and the usefulness of the grader, which he considered the only effective means of ridding seed of barley. After having dealt with various sources of weed infection, he directed attention to the method of handling the crop, characterising as a "ridiculous farce" the practice of stacking together all wheats, irrespective of weight or standard, and selling on an average sample, whilst the farmer who delivered an extra good sample only got the same price as the man whose sample just came up to the standard.

The discussion revealed that delegates generally favored the sowing of clean seed. A suggestion was made that a grader could be, with advantage, purchased co-operatively in some cases.

#### BLACK SPOT IN VINES.

A discussion on means of combating black spot, which had caused considerable loss to vinegrowers in the district, was initiated by Mr. M. Nolan. It was mentioned by Mr. Neate that tests of various means of treating the disease had been carried out under the auspices of the Bureau on Mr. Jarman's property, but no definite results had been arrived at. The experiences of many of the delegates were detailed and Mr. G. Quinn (Horticultural Instructor) described the accepted methods of treating the disease practised in the older vinegrowing countries of the world.

#### STANDARD FRUIT CASE.

Mr. F. J. Knappstein (Clare) introduced the subject of the utilization of the kerosine and benzine cases for fruit packing. He suggested that if a 14in. x 9½in. x 16½in. case were allowed to be used the particular cases referred to above could be made to suit simply by moving the head board in for a certain distance and cutting off the projecting ends. The Horticultural Instructor (Mr. Geo. Quinn) detailed the objections to the suggested alteration of the standard case.

#### RESOLUTIONS.

*Inspector of Apiaries.*—At the instance of Mr. E. D. Powell (Williamstown) it was resolved "That in the opinion of this Conference the time is opportune for the appointment of an Inspector of Apiaries."



Conference of Lower Northern Branches of the Agricultural Bureau, held at Clare on February 29th, 1921. Some of the Delegates who were present.

## NEXT CONFERENCE.

It was agreed that the Conference for 1922 should be held at Angaston.

## PAPERS.

Mr. H. W. Lewcock (Clare) read a lengthy paper dealing with the cultivation of citrus fruits. He described the soil and climatic requirements of the orange and the method of planting, manuring, picking, handling, and marketing the fruit. This paper gave rise to a most interesting discussion, in the course of which Mr. H. Wicks discussed at length the relative merits of different stocks.

A paper by Mr. P. O. Knappstein, entitled "Manuring of Vineyards," was then read. The writer of the paper mentioned that up till the present manuring was not carried out to any extent in the Clare district, but considered that it was unreasonable to expect the vineyards to keep on producing payable crops of grapes year after year unless the soil was enriched. Stable manure, green manuring, and chemical fertilizers were dealt with, and the various practices associated with their application discussed.

## FROM LABOR TO REFRESHMENT.

At the close of the business delegates were entertained by the Clare Branch at supper. Following the Loyal Toast, Mr. C. Neate proposed "The Agricultural Bureau," which was responded to by Mr. H. J. Finnis. "The Visiting Officers and Delegates" were toasted at the instance of Mr. J. Scales, and Professor A. J. Perkins, Messrs. A. L. McEwin, sen., and E. D. Powell replied. Mr. A. L. McEwin, jun., submitted "The Clare Branch," which was responded to by Mr. P. H. Knappstein. Capt. White gave "The Press," to which Messrs. Tillbrook and Fisher responded.

## CLARE AND ITS SURROUNDINGS.

Delegates were afforded an excellent opportunity of viewing Clare and its surrounding country on the morning following the Conference. In char-a-banc and motor car, under the guidance of Mr. Knappstein, the party left the town hall on a tour of inspection, the route being part way along the Blyth Road, thence through Stanley Flat to Bungaree Siding, with the Seven-hills cellars as the final place of call. Here the visitors were entertained by the Superior of the College (Father McCarthy) and Brother Boehmer, who has charge of the cellars.

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SUNFLOWERS.

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The sunflower is coming into considerable prominence as a summer-growing fodder crop, and the following questions relating to the cultivation of this crop, together with replies thereto, supplied by the Superintendent of Experimental Work (Mr. W. J. Spafford), should prove of interest to prospective growers:—

## 1. Does the soil require much preparation?

Like for all summer-growing crops, the better the soil preparation the higher the returns will be from the sunflower crop. When preparing the land, the conservation of moisture must be the main consideration, and so it should be ploughed not later than mid-September, and be cultivated (harrowed or spring-tooth cultivators) after every shower of rain. If no rain falls between ploughing and seeding, the land should be rolled in front of the drill.

2. When should the seed be sown ?

The seed can be sown any time between August and the end of November, but naturally, in average years, better results are obtainable from early seeding.

3. How should the seed be sown ?

The seed should be sown in rows about 30in. apart, which is easily done with the ordinary seed-drill by removing three out of every four stars from the manure box so that only every fourth star is left to sow manure, and replacing them with small bolts or large-headed rivets. About 5lbs. of sunflower seeds are then mixed with  $\frac{1}{2}$  cwt. bonedust, or other suitable material to carry the seed, which mixture is sown through the manure-box of the drill, after having set the drill to sow 2cwts. manure per acre.



A Crop of Sunflowers grown for Forage Purposes on the holding of  
Mr. South, "Nowillilla," Ashbourne.

4. Does the crop require much cultivation during its growth ?

All summer-growing crops benefit very much from cultivation during growth, and in most cases it is found that every cultivation given more than pays for its cost in increased returns. This applies to sunflowers as well as to others, but some very good crops have been grown this year with very little cultivation between the rows. To safeguard the crop, the land between the rows should be cultivated as soon as the rows of plants are distinctly visible, and again whenever the soil sets together, or when weeds are in evidence. Due to the rapidity of the growth made by sunflowers and the large size of their leaves, the land is soon shaded, and so the crop does not, as a rule, need so much cultivation as other summer crops.

5. What approximate yield per acre can be expected ?

A well developed crop grown without irrigation should return from 14 tons to 20 tons of greenstuff per acre.

6. Will all classes of stock eat it?

Farm livestock do not prefer sunflowers to crops of the grass family, but once they have taken to the crop, horses, cattle, and sheep eat it readily.

7. How many sheep per acre will the crop carry?

The crop is not wholly suited to be grazed by sheep, owing to the coarseness of the growth made, but these animals soon learn how to eat it to the ground. Any sort of a fair crop will carry sheep at the rate of six per acre per year, which is equal to 72 sheep per acre for one month; a heavy crop will carry more sheep.

8. How is the crop harvested?

Best results have been secured from this crop by cutting it with a maize-binder or a mower and then chaffing it, to be fed either as greenstuff or made into ensilage, but livestock will harvest it by grazing it off.

9. When should it be harvested or grazed?

If the crop is to be taken off in one cut or one feeding, maximum results will be secured in harvesting when about one-third of the apex flowers of the crop have just opened, but more produce will be obtained if the crop is harvested just at the first buds appear, the land cultivated between the rows, and the plants left to grow a second crop.

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## ORCHARD NOTES FOR SOUTHERN DISTRICTS.

[By C. H. BEAUMONT, Orchard Instructor.]

The value of spraying with arsenate of lead for the control of codlin moth has been clearly demonstrated this year. Orchards carefully attended to are practically free from damage; others, where the late sprayings have not been applied, are badly attacked by the later hatchings of the pest. It is useless to take on the work of spraying unless we are prepared to attend to it at the right time. There is always a lot of work to do when the fruit is coming in, but we must give the spraying first consideration if we want to get the value out of it.

In orchards where fungus pests have been very troublesome, such as curl leaf, shothole, or black spot, it is well to spray the trees thoroughly with Bordeaux mixture this month. Cherries and Japanese plums especially should be attended to.

The packing of apples for export is in full swing; packers must be careful to have only good cases. I know there is a difficulty about the cases, but do not use warped ones; especially see that the side laths are well cut. I have had to examine a lot of the fruit being exported, and was sorry to see so much of it damaged by the edge of the side laths, even before it had been removed from the truck in which it was consigned by the grower.

Pruning may be commenced on any trees whose leaves have finished their year's work and are turning yellow. Apricots and peaches may soon be put in hand. It is also a good thing, if time permits, to remove the rods which have borne the season's grapes; this will open up the vine, and tend to mature the wood which is to bear next year's crop.



## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on March 1st:—

**BUTTER.**—Difficulties in connection with supplying the trade during the past month have been very acute, especially towards the latter end, owing to the supplies of first grade having declined rapidly. This was brought about by the extremely hot weather experienced, and it has become necessary now to import quantities of top grades from Victoria to fill the shortage. On the other hand, there are ample supplies of second and third grade lines, for which there is a very limited local sale, and these have been placed in cold store on account of the Imperial Government contract. Values are:—Factory and creamery, in prints, 2s. 5d. to 2s. 6½d.; best separators and dairies, 2s. 4d. to 2s. 6d. per lb.; fair quality, 2s. 2d. to 2s. 3½d. per lb.; well conditioned store and collectors, 2s. to 2s. 1d. per lb.; weather affected lots, 1s. 10d. to 1s. 11d. per lb.

**EGGS.**—The quality of consignments received during the month have been, speaking generally, very much weather affected, but an improvement was noticeable at the latter end of the period, values being:—Fresh hen, 1s.; duck, 1s. 1d. per dozen.

**CHEESE.**—Demand locally has maintained fairly well, and with an occasional shipment to Western Australia the market has been kept clear, the range in values at present being 12½d. to 13½d. for large to loaf.

**HONEY.**—Sales in this line have been somewhat slower than hitherto, and the market eased during the month about 1d. per lb. Prime clear extracted selling at 5d. to 5½d. per lb.; second grade 4d. per lb. Beeswax 2s. per lb.

**ALMONDS.**—New seasons are now coming along in small lots, but the demand is none too active. Brandis, 10d. per lb; mixed softshells, 9d. per lb; hardshells, 4d.; kernels 1s. 11d. to 2s. per lb.

**BACON.**—Values have remained practically stationary throughout the month, with moderate quantities selling. Best factory cured sides, 1s. 6d. to 1s. 6½d.; middles, 1s. 7d. to 1s. 7½d.; hams, 1s. 9d. to 1s. 10d. per lb.

**LIVE POULTRY.**—Better quantities have been marketed during the past month, but the quality in many of the pens has not been of the best, and prices for the light sorts have eased. Values at the moment are:—Prime table roosters, 5s. 3d. to 7s. 3d.; well conditioned cockerels, 3s. 9d. to 5s.; plump hens, 4s. 6d. to 6s.; light birds, 2s. 6d. to 4s. 3d., a few pens of weedy sorts selling lower; ducks, 3s. 6d. to 7s. 3d., according to condition; geese, 5s. to 6s.; turkeys, from 1s. 6d. to 2s. per lb. live weight for prime condition; fair quality, 1s. to 1s. 5d.; fattening sorts lower; pigeons, 10d.

**POTATOES.**—Hills and plains grown potatoes are now about finished, so that heavier call has been made on Gambiers, whilst a fair number of trucks of Victorian Carmens have also come along.

**ONIONS.**—Are still continuing plentiful in supplies. Quotations:—Potatoes, Gambier Pinkeyes, £5 10s. to £6 10s. per ton on trucks Mile End; Carmens, £3 to £9 per ton on trucks Mile End or Port Adelaide. Onions, £5 10s. to £7 per ton on trucks Mile End or Port Adelaide.

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## THE AGRICULTURAL OUTLOOK.

### REPORTS FOR THE MONTH OF FEBRUARY.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

**Booborowie.**—Weather—February was very dry until the latter end of the month, when on three different dates 112 points of rain were registered. Some extremely hot weather prevailed, with thundery conditions at times. Crops—The lucerne fields are looking well and showing luxuriant growth. Natural feed is still abundant. Stock are all in from fair to good condition. Pests—There is nothing worthy of mention other than the saffron thistle.

**Eyre Peninsula.**—Weather—Changeable, being very warm at times; thundery towards end of month, with thunderstorms for four days in succession, there being nearly 2½ in. of rain. This will hinder burning operations considerably, on account of the tuft grass responding to these rains. Crops—All cereals harvested. Lucerne cultivated in rows doing exceptionally well. A few of the stone fruits bore fruit this year, and the trees are continuing to make wonderful growth. Natural feed good. There should be an abundance of grass after these heavy rains. Stock all in O.K. order, and free from disease. Pests—Rabbits are commencing to put in an appearance. Miscellaneous—There has not been much burning done in this district up to date, and I am afraid there will be considerably less burnt than was anticipated.

**Kybybolite.**—Weather has generally been close and humid, with fair amount of thundery conditions, with several storms. Altogether about 80 points of rain has been registered, making a total of nearly 2 in. for the year. Crops—All harvesting has been completed, and except in a few cases yields have been light. A start has been made to prepare land for sowing crops for green feed. Natural Feed—Hog weed is still fairly plentiful, but natural feed is becoming short. Stock generally are healthy and in good condition. Pests—Birds have been very destructive among fruit trees.

**Turretfield.**—The weather during this month has been very sultry. Hot spells and close, sultry days, and thunderstorms have been prevalent during the end of the month, and these storms have done considerable damage to the district. The rainfall has been very patchy, heavy showers falling in some places, while the adjoining farms have received only a sprinkle. Grain crops have been all gathered in, and, on the whole, are very satisfactory. The grape crop is now being cut, and the yield appears to be pretty fair, although in some instances the vines and grapes have been burnt by the excessive heat. Feed—The rains have made nice green pickings in the stubble, but have destroyed the value of the dry feed. Pests—Starlings are having a bad time. The crack shots of the neighborhood are lying ambushed under the vines, and the scapls of many birds decorate poles in the vineyards and gardens.

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## MURRAY BRIDGE HERD TESTING SOCIETY.

## RESULT OF BUTTERFAT TESTS FOR OCTOBER, 1920.

Dairy No.	Cows in Herd.	Milk for Month.	Butterfat for Month.	Average Milk per Cow.	Average Butterfat per Cow.
		Lbs.	Lbs.	Lbs.	Lbs.
1/A .....	12	8,167	345-73	680-58	28-81
1/B .....	13	9,059	398-34	696-85	30-64
1/C .....	45	30,077	1,207-97	668-38	26-84
1/D .....	20	10,509	496-89	525-45	24-84
1/E .....	14	5,956-5	246-49	425-46	17-61
1/F .....	11	8,187-5	323-83	744-32	29-44
1/G .....	40	33,490	1,284-23	837-25	32-11
1/H .....	15	6,014	240-94	400-93	16-06
1/I .....	15	12,790	496-05	852-66	33-07
1/J .....	16	8,551-5	359-52	534-47	22-47
1/K .....	13	5,342-5	215-84	410-96	16-60
1/L .....	13	9,842-5	422-02	757-12	32-46
1/M .....	19	9,269	405-12	487-84	21-32

## RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1920.

Dairy Herd No.	Average No. of Cows in Herd.	Milk for Month.	Butterfat for Month.	Average Milk per Cow.	Average Butterfat per Cow for Month.	Butterfat per Cow for Two Months.
		lbs.	lbs.	lbs.	lbs.	lbs.
1/A .....	12	7,740	330-22	645-00	27-52	56-33
1/B .....	14	9,496-5	360-04	678-30	25-72	56-36
1/C .....	45	28,255	1,069-07	627-89	23-76	50-60
1/D .....	20	8,141-5	390-84	407-08	19-54	44-38
1/E .....	14	4,756	214-92	339-71	15-35	32-96
1/F .....	11	5,829	235-75	529-91	21-43	50-87
1/G .....	40	32,425-5	1,135-63	810-64	28-39	60-50
1/H .....	15	6,049-5	253-74	403-30	16-92	32-98
1/I .....	14-93	12,059-5	433-58	807-56	29-03	62-10
1/J .....	15-43	11,120	457-72	720-52	29-66	52-13
1/K .....	14	6,405	277-81	457-50	19-84	36-44
1/L .....	12-90	8,740	382-62	677-52	29-66	62-12
1/M .....	19	7,255	339-59	381-84	17-87	39-19
1/N * .....	20	12,116	526-74	605-80	26-34	26-34*

\* For one month only.

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Tuesday, February 8th, there being present Mr. C. J. Tuckwell (Chairman), Professor Arthur J. Perkins, Capt. S. A. White, Col. Howell, Messrs. F. Coleman, W. S. Kelly, A. M. Dawkins, T. H. Williams, H. Wicks, and the Acting Secretary (Mr. H. J. Finnis). An apology was received from Mr. W. J. Colebatch.

*Veterinary Surgeon for Eyre Peninsula.*—This matter was again brought before the Board, when the following report from the Chief Inspector of Stock (Mr. T. H. Williams) was considered:—"I have conferred with the Government Veterinary Surgeon on this matter, and we are of the opinion that there would be very little actual work for a veterinary surgeon to do if located on Eyre Peninsula. It would cost not less than £600 per year. The Government would also be called upon to provide a suitable residence for a married man. We are of the opinion that there are practically no infectious or contagious diseases to be dealt with in the Minnipa or other West Coast Districts. Inspector Winkler has recently spent some weeks on the West Coast, and reports that only a few minor ailments in large stock, and a few ticks on sheep were met with. If the Government comply with the request to locate a veterinary surgeon at Minnipa, similar demands will be made from many other centres. Arrangements can be made for a veterinary officer of this department to visit the West Coast districts at such times as he can be spared, for the purpose of lecturing at such places as may be considered most suitable."

The Hon. the Minister of Agriculture stated that he agreed with the report of the Chief Inspector, and that he could not recommend Cabinet to approve of the expenditure. After the matter had been fully discussed the Secretary was instructed to forward the following reply to the Minister:—"It is respectfully pointed out in respect to the Hon. Minister's reply that the Board feels that the request of the Eyre Peninsula Branches of the Agricultural Bureau for a veterinary surgeon to be stationed on the Peninsula is a reasonable one. As the Chief Inspector of Stock has intimated, the cost would not be less than £600 per annum. But it must be remembered that there are over half a million head of stock on the Peninsula, including 26,221 horses, 13,589 cattle, and 547,995 sheep. The Board's attitude is that the services of a veterinary surgeon are required, not so much from the point of view of the administration of the Stock Diseases Act (which duties, of course, he could undertake), but in the way of rendering veterinary advice and assistance to stock holders. From time to time to send a stock inspector into the district does not meet the case. The stockowner on Eyre Peninsula may be faced with probable loss of stock at any moment. A Government veterinary surgeon stationed on the Peninsula would be available within a reasonable time, but under present circumstances the only course open to owners is to secure help from the mainland, an expensive and time-involving expedient. The Board readily admits that if the request for a veterinary surgeon to be placed on Eyre Peninsula is granted, similar demands may be

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## TO THOSE WHO HAVE OR ARE ABOUT TO MAKE THEIR WILLS.

A STRIKING INSTANCE OF THE RISK OF APPOINTING PRIVATE EXECUTORS.

*"The death of James Gordon Bennett, the wealthy owner of the NEW YORK HERALD, took place not very long ago. Mr. Bennett appointed his personal friend, James Stillman, an executor. Mr. Stillman died before any progress had been made in settling the Bennett Estate.*

*He had appointed John W. Sterling, the famous New York lawyer, an executor of his estate. Before Sterling could begin work he died suddenly while fishing in Canada. Sterling appointed James O. Bloss, the New York banker, executor of his estate. But within a few weeks the third death in the chain occurred. The estates of Bennett, Stillman, and Sterling aggregated about 75,000,000dols. (say £15,000,000 sterling).*

*"Old Colony News Letter."*

*"From our standpoint the principal lesson is this:—The long interlocking complications that arise after a man's death, during which the families are left to shift the best they may while the tedious grind of untangling his affairs drags through the Probate Court, gives irresistible force to the argument for A TRUSTEE COMPANY AS YOUR EXECUTOR, AN EXECUTOR WHO NEVER DIES OR IS SICK, AND IS FOREVER 'ON THE JOB.'"*

*"Old Colony News Letter."*

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made from other sources. The Board respectfully submits, however, that action would in no way establish a precedent for other parts; its isolation from the mainland, and the peculiar difficulties under which settlers there are working at the present time, place Eyre Peninsula in a class by itself."

*Licensing Stud Bulls.*—Mr. W. S. Kelly, one of the members appointed by the Board to consider, in conjunction with delegates from the Australian Jersey Herd Society, the Royal Agricultural and Horticultural Society, and the Stock Owners' Association of South Australia, a suggestion that bulls should be licensed, reported on negotiations that had taken place, and intimated what steps it had been determined to take. Mr. Kelly expressed the opinion that a great deal of good would be done by the inauguration of an annual sale of approved sires, and the purchaser of such stock should be given a Government subsidy, provided he hired the bull to his neighbors at a reasonable fee. Mr. Kelly was then asked to draft a scheme embodying his ideas, and submit it at the next meeting.

*Residential Clauses in Leases.*—An intimation was received from the Coomandook Branch of the Bureau that in some instances in their district the conditions of leases were not being carried out. It was decided to secure from the Branch in question details of the blocks referred to.

*Export Trade in Pig and Poultry Products.*—The following report was received from the General Manager of the Produce Department (Mr. G. A. W. Pope), who was asked to report on the advisability and practicability of establishing a factory for the handling of pig products for export in connection with the Government Produce Works at Port Adelaide:—"The Government guaranteed 5d. a pound dead weight at the Depot for approved porkers and bacon pigs for two years ending December 31st, 1919. As soon as it becomes necessary I would again recommend the Government to give another guarantee for two or more years, as I am sure the previous one gave a very great assurance to pig raisers. Of course, such a guarantee does not mean that the producer must sell at that price, but that he shall have the maximum obtainable above that price, and that the Government pay the loss should there be any. The guarantee must be high enough to cover the cost of production and fair profit, but it must also bear some relation to the probable over-sea market. In my opinion there is no need for the Government to establish a bacon factory, as either frozen pork or green bacon must be shipped, and there is at present more than sufficient accommodation for the work. It is not advisable, however, to do anything at present, as Adelaide market values are very high, and have been for some time, with some good prospects of a continuance for a good period, and with which the pigraiser is content. The time will come when Australia must approach the over-sea markets ruling at more normal values, and I think it would be unwise to encourage any producer to expect a continuity of the very high stock prices of the past years. I, however, confidently believe that there are good prospects for an over-seas' trade in frozen pork and, perhaps, green bacon, and this department will commence a trade as soon as an opportunity offers. If the Advisory Board con-



sider some present form of guarantee is necessary, I would suggest that they go into the question of the cost of raising porkers and baconers, say, from 80lbs. to 140lbs. weight, and this can then be compared with probable over-sea prices for the purpose of asking for a decision on the question."

Mr. A. M. Dawkins said high prices had been ruling for pig products for some time, but he believed that before long the market would experience a slump. The best thing that could be done would be to provide a means for the shipment of the produce. The Director of Agriculture (Professor Arthur J. Perkins) said the Manager of the Produce Department had missed the point. The question was whether they could expand or not. Until they had the means of inducing people to go in for pigs on a large scale the pig industry would stagnate. In fact, to-day they had less pigs in the State than they had 40 years or 50 years ago. Until they had an export market for cured pork he was sure that the industry would not expand. The only way to attain their requirements was to induce the Federal Government to assist them. Personally, he was not in favor of opening a bacon factory at Port Adelaide; private enterprise could attend to that if sufficient inducement offered. He submitted a statement which showed the value of pig products (mostly bacon and ham) imported into Great Britain, as follows:—

Before the war . . . .	approx. £20,000,000
1918 . . . . .	over £100,000,000
1919 . . . . .	over £90,000,000

The value of the Commonwealth and South Australian exports of bacon and ham was as follows:—

	Commonwealth.	S.A.
1916-17 . . . . .	£60,358	£1
1917-18 . . . . .	£321,573	£2
1918-19 . . . . .	£378,723	nil

The food material necessary to produce 1lb. of pork was, roughly, 6lbs. of barley or 5lbs. of wheat. The average local values of wheat and Cape barley in 1918 and 1919 were as follows:—

	Wheat.		Barley.	
	Bush.	5lbs.	Bush.	6lbs.
	s. d.	d.	s. d.	d.
1918 . . . . .	4 9	4.75	3 8	5.04
1919 . . . . .	5 3	5.6	4 0	5.76

The number of pigs in South Australia during the five years 1915 to 1919 were:—

Year.	Head.
1915 . . . . .	66,237
1916 . . . . .	118,542
1917 . . . . .	110,353
1918 . . . . .	79,078
1919 . . . . .	60,295

At the instance of Mr. Dawkins, seconded by Mr. Coleman, it was decided that the Premier be asked again to bring the matter under the

notice of the Federal Government, with the original request that a bonus might be offered in the interests of the pig industry.

*Shipping Accommodation at Port Lincoln.*—A resolution of the Eyre Peninsula Branches' Conference, urging the building of a wharf at Port Lincoln in lieu of a suggested third jetty, was received back from the Minister of Marine, with an intimation that the Government had definitely determined that additional shipping accommodation at Port Lincoln was to be provided by the erection of a new jetty.

*Polda Water Scheme.*—In reply to a resolution from the Eyre Peninsula Conference, urging the Government to push on with the Polda water scheme, an intimation was received that the district that would be served by this storage would be examined as soon as possible.

*Water Supply, Eyre Peninsula.*—The Commissioner of Public Works, in response to the Board's recommendation that steps should be taken to provide storage for all the water that ran off granite outcrops on Eyre Peninsula, stated that no action in this direction could be taken at present. On the motion of Mr. Coleman, seconded by Capt. White, it was decided to ask the Commissioner to reconsider his decision, and to press on with the work as soon as possible.

*Railway Carriage of Mallee Stumps.*—The Board recently suggested to the Railways Commissioner that his department might issue notes of weights of mallee stumps carried over the railways, which notes could be used as a basis for the sale. The Railways Commissioner stated that, in view of the fact that weighbridges could not be provided at all stations and sidings, it would be impossible for the department to adopt the suggestion. The Board determined to point out that the suggestion did not involve the provision of weighbridges at all stations and sidings. As freight on mallee roots was charged on a weight basis, all consignments were run over the weighbridges at some portion of their journey. The additional requirement was merely the issue by the department of a note setting out the weight in cases in which it was specially asked for.

*Galvanized Iron for Settlers.*—A communication was received from the Smoky Bay Branch, expressing regret that the Board's decision in relation to the suggested provision of galvanized iron for water catchment purposes.

*Commonage for South-Eastern Stock.*—It was decided to transmit to the Minister an intimation from the Moorak Branch, giving particulars of land in the district considered suitable for commonage purposes.

*Resolutions from Eyre Peninsula Conference, 1919.*—A resolution from the 1920 Conference of Eyre Peninsula Branches, asking for definite replies to resolutions carried at the 1919 Conference, was received. The Board decided to draw the Minister's attention to the fact that there were apparently one or two questions still unanswered, and request replies thereto.

*Cream Testing by Government Officials.*—The Port Elliot Branch suggested that a Government official might be sent to the country occasionally, to test cream. It was decided to seek a report from the Dairy Expert on the matter.

*Afforestation.*—On the motion of Capt. White, seconded by Mr. W. S. Kelly, it was decided that the attention of the Minister be drawn to his promise to arrange a meeting between the Minister of Forestry and the Afforestation Subcommittee of the Advisory Board. The Board also decided to request that early arrangements should be made for the meeting.

*Conservation of Timber Along the Murray.*—Capt. White moved and Mr. F. Coleman seconded—"That the Minister be asked whether he has received a report from the Conservator of Forests as to the condition of the timber along the River Murray, and, if so, that the Board might be supplied with a copy thereof.

*Date of Next Meeting.*—It was decided that the next meeting of the Board should be held on Thursday, March 3rd.

*New Branch.*—Approval was given for the formation of a Women's Branch of the Bureau at Williamstown, with the following ladies as foundation members:—Mesdames Warren, Cundy (2), Coleman, Gower, Green, Hammatt (2), Hamilton (2), Harris (2), Haworth, Pinson, Lane, Wild, Wilson, and Misses Hintz, Childs, and Spencer.

*Branch to be Closed.*—It was decided to close the Warrow Branch.

*New Members.*—The following names were added to the rolls of existing Branches—Orroroo—W. W. Collins; Glencoe—F. Hughes, W. Sims; Port Elliot—F. E. D. Wood; Crystal Brook—H. Morrish, A. J. Green; Barmora—F. Clark, H. C. Clark, H. W. P. Cooney; Lone Gum—N. V. Paterson; Kalangadoo, W. J. Evans; Williamstown—J. Howarth, A. E. Marr, J. E. Coleman; Clare—Brother Boehmer.

**THE BEST WINS EVERY TIME.**

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**TOP BRAND  
SUPER**

REMEMBER!!  
THERE IS ONLY  
**ONE  
BEST.**

**THE BEST OF ALL**

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MANUFACTURERS -

**THE ADELAIDE CHEMICAL AND FERTILIZER COMPANY, Ltd.,**

CURRIE STREET, ADELAIDE.

## EGG-LAYING COMPETITION, 1920-1921.

HELD AT THE PARAFIELD POULTRY STATION, PARAFIELD, UNDER THE DIRECTION  
OF D. F. LAURIE (GOVERNMENT POULTRY EXPERT AND LECTURER).

A TWELVE MONTHS' TEST STARTED ON APRIL 1st, 1920, AND TO TERMINATE MARCH 31st, 1921.]

## SECTION 1.—LIGHT BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Name and Address.	Bird No.	Month ending 28/2/21.	Score to Date.	Bird No.	Month ending 28/2/21.	Score to Date.	Bird No.	Month ending 28/2/21.	Score to Date.
WHITE LEGHORNS.									
Bertelsmeier, C. B., Kensington ..	1	22	150	2	18	141	3	19	144
McDonnell, G., Auburn, Melbourne	4	18	136	5	19	152	6	Dead	
Saunders, R. S., Hamley Bridge ...	7	10	101	8	12	61	9	21	162
Ryan, J., Silvan, Victoria .....	10	21	145	11	20	169	12	18	147
Moritz Bros., Kalangadoo .....	13	21	193	14	Dead	15	19	183	
Brown, J. P., Ballarat, Victoria ..	16	18	113	17	1	66	18	19	138
Bowers, A. H., Richmond, S.A. ...	19	20	108	20	Dead	21	7	119	
Eckermann, W. P., Eudunda .....	22	20	143	23	20	131	24	18	124
Burton, C. J., Mallala .....	25	*—	*—	26	*—	*—	27	*—	*—
Beythien, E. W., Scott's Creek ..	28	18	89	29	18	85	30	16	96
Moritz Bros., Kalangadoo .....	31	21	144	32	13	155	33	21	182
James, H. B., Kew, Victoria .....	34	18	111	35	19	108	36	16	176
Mockhouse, A. J., Woodside .....	37	16	120	38	19	149	39	19	174
Clear, H. S., Broken Hill .....	40	*—	*—	41	18	153	42	21	149
Roantree, W., Broken Hill .....	43	*—	*—	44	*—	*—	45	11	81
Beythien, E. W., Scott's Creek ..	46	20	130	47	*—	*—	48	*—	*—
Hockins, E. D., Kadina South ..	49	*—	*—	50	18	123	51	19	134
Raymoor Poultry Farm, Kilkenny	52	19	104	53	18	129	54	*—	*—
Keezan, H. V., Wallaroo .....	55	*—	*—	56	19	108	57	*—	*—
Lampert, Mrs. S., Piccadilly .....	58	21	127	59	19	148	60	16	150
Parsons, E. H., Pinnaroo .....	61	21	158	62	13	80	63	17	104
Raymoor Poultry Farm, Kilkenny	64	17	155	65	21	165	66	19	129
Stevens, H. J., Broken Hill .....									
Glenelg River Poultry Farm, Mt. Gambier	1	22	150	2	20	151	3	21	158
Wilmington, Mrs. G., Milang .....	4	20	190	5	20	190	6	19	184
Rutledge, M., Broken Hill .....	7	17	141	8	4	112	9	15	142
Vercoe, Wm., Bayswater, Victoria	10	20	161	11	*—	*—	12	19	128
Stockman, A., Goodwood .....	13	19	146	14	20	175	15	*—	*—
Ritter, Wm., Macill .....	16	23	153	17	15	135	18	20	138
Blake, Mrs. M., Berowra, N.S.W.	19	21	148	20	19	138	21	19	148
Stidson, M., Cheltenham .....	22	22	157	23	22	155	24	20	164
Bamford, W. H., Glenelg .....	25	17	136	26	23	183	27	17	170
Windyridge Poultry Farm, Blackwood	28	20	161	29	22	198	30	19	166
Howie, H. H., Mount Gambier ..	31	22	163	32	22	152	33	16	142
Green, A. J., Crystal Brook .....	34	19	164	35	19	162	36	21	165
Green, F. W. H., Monteith .....	37	22	175	38	23	211	39	12	111
Rivett, J., Lockleys .....	40	21	192	41	20	172	42	14	160
Small, E. W., Mount Gambier ..	43	*—	*—	44	—	—	45	—	—
Herbert, C., Alberton .....	46	22	130	47	19	127	48	2	113
Holmes, F. A., Naracoorte .....	49	24	154	50	23	143	51	24	191
	52	23	140	53	23	134	54	21	146

\* Failed under Regulation 12

EGG-LAYING COMPETITION—*continued*

Row No.	Name and Address.	Bird No.	Month ending 28/2/21.	Score to Date.	Bird No.	Month ending 28/2/21.	Score to Date.	Bird No.	Month ending 28/2/21.
WHITE LEGHORNS— <i>continued</i> .									
B	Green, F. W. H., Monteith .....	55	20	124	56	21	177	57	22
B	Herbert, C., Alberton .....	58	—	51	59	20	123	60	23
B	Urwinn, A. P., Balaklava .....	61	19	157	62	19	127	63	12
B	Purvis, W., Glanville Blocks .....	64	18	127	65	13	143	66	18
C	Green, F. W. H., Monteith .....	1	22	145	2	20	154	3	21
C	Holmes, F. A., Naracoorte .....	4	19	134	5	21	129	6	*
C	Axtell, Mrs. J., Glen Osmond .....	7	18	133	8	20	145	9	14
C	Finn, H. J., jun., Angaston .....	10	22	122	11	22	128	12	17
C	Coleman, A. C., Grange .....	13	10	108	14	22	172	15	D
C	Green, F. W. H., Monteith .....	16	20	187	17	21	184	18	22
C	Anderson, J., Prospect .....	19	*	*	20	*	*	21	9
C	Axtell, Mrs. J., Glen Osmond .....	22	*	*	23	18	122	24	19

## TWO WHITE LEGHORNS, ONE ANCONA.

C	Tester, Geo. P., Naracoorte .....	25	21	136	26	17	184	27	21
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## SECTION 2.—HEAVY BREEDS (SINGLE TESTING). THREE PULLETS IN EACH

## BLACK ORPINGTONS.

C	Lawson, E. A., Camberwell, Victoria .....	28	10	87	29	4	108	30	11
C	Bertelsmeier, C. B., Kensington .....	31	Dead	32	14	140	33	14	
C	Shaw, R. R., Crystal Brook .....	34	14	146	35	12	114	36	19
C	Jarman, T. E., Epping, N.S.W. ....	37	*	*	38	*	*	39	13
C	Hogg, R. J., Morphet Vale .....	40	20	124	41	12	122	42	*
C	Shaw, R. R., Crystal Brook .....	43	17	148	44	7	93	45	7
C	Holmes, F. A., Naracoorte .....	46	1	82	47	15	91	48	18
C	Buttfield, C. C., Crystal Brook .....	49	10	118	50	Dead	51	16	
C	Shevill, W. A., Beaumaris, Victoria .....	52	15	106	53	*	*	54	6
C	Eckermann, W. P., Eudunda .....	55	*	*	56	19	141	57	9
C	Lampert, Mrs. S., Piccadilly .....	58	10	110	59	7	100	60	*
C	Bansemmer, Mrs. B., Beaumont .....	61	13	137	62	20	170	63	12
C	Siebler, J. M., North Broken Hill .....	64	*	*	65	*	*	66	10
D	Holmes, F. A., Naracoorte .....	1	20	171	2	Dead	3	16	
D	Purvis, W., Glanville Blocks .....	4	21	137	5	Dead	6	9	
D	Bertelsmeier, C. B., Kensington .....	7	16	187	8	21	155	9	8
D	Tester, G. P., Naracoorte .....	10	20	118	11	8	86	12	23
D	Kalms, A. G., Neale's Flat .....	13	Dead	14	7	105	15	6	

## RHODE ISLAND REDS.

D	Stacey, R. S., Hamley Bridge .....	16	12	102	17	20	106	18	13
D	Stockman, A., Goodwood .....	19	8	108	20	12	122	21	9

## RHODE ISLAND WHITES.

D	Bansemmer, Mrs. B., Beaumont ..	22	12	110	23	*	*	24	23
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\* Failed under Regulation 12

## SECTION 3.—LIGHT BREEDS (PEN TEST). SIX PULLETS IN EACH PEN.

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending 28/2/21.	Total Eggs Laid from 1/4/20 to 28/2/21.
1	Hodges, F., Ballarat North, Victoria	White Leghorns	68	1,041
2	Bertelsmeier, C. B., Kensington	"	69	888
3	Beythien, E. W., Scott's Creek	"	77	762
4	McDonnell, G., Auburn, Victoria	"	55	877
5	Bertelsmeier, C. B., Kensington	"	46	795
6	Thompson, E. F., Franklin	"	72	828
7	Purvis, W., Glanville Blocks	"	44	841
8	Smith & Gwynne, Gawler South	"	34	677
9	Anderson, S., Gawler Railway	"	63	1,006
10	Eckermann, W. P., Eudunda	"	34	736
11	Beythien, E. W., Scott's Creek	"	44	683
12	George, R., New Queenstown	"	41	847
13	Deacon, J. R., Solomontown	"	27	810
14	Alford, Thos., Broken Hill	"	56	1,040
15	Evans, H. A., Richmond	"	*—	*—
16	Connor, D. C., Gawler	"	74	806
17	Raymoor Poultry Farm, Kilkenny Blocks	"	111	1,022
18	Lampert, Mrs. S., Piccadilly	"	35	623
19	Pool, F. J., North Norwood	"	111	721
20	Woodhead, N., Torrensaville	"	71	750
21	Thompson, E. F., Franklin	"	44	698
22	Randall, J., Bowden	"	37	517
23	Earle, E., Solomontown	"	*—	*—
24	Willington, Mrs. G., Milang	"	29	771
25	Veroce, Wm., Sefton Park	"	82	1,005
26	Pugsley, A., Hindmarsh	"	33	564
27	Howie, H. H., Mount Gambier	"	27	784
28	Purvis, W., Glanville Blocks	"	61	763
29	Anderson, W., Kapunda	"	53	641
30	Broderick, P. J., Burra	"	—	—
31	Eldridge, J. H., Norwood	"	59	819
32	Pope Bros. & Co., Hectorville	"	67	692
33	Oakey, E., Mannahill	Brown Leghorns	66	688

## SECTION 4.—HEAVY BREEDS (PEN TEST). SIX PULLETS EACH ENTRY.

34	Hogg, R. J., Morphett Vale	Black Orpingtons	*—	*—
35	Bertelsmeier, C. B., Kensington	"	*—	*—
36	Eckermann, W. P., Eudunda	"	61	725
37	Lampert, Mrs. S., Piccadilly	"	22	688
38	Bertelsmeier, C. B., Kensington	"	56	638
39	Bansemmer, Mrs. B., Beaumont	"	84	656
40	Purvis, W., Glanville Blocks	"	*—	*—
41	Siebler, J. M., North Broken Hill	"	*—	*—
42	Bertelsmeier, C. J., Kensington	"	*—	*—
43	Purvis, W., Glanville Blocks	"	*—	*—
44	Frost, F. W., Wallaroo	Barred Rocks	46	525
45	Lampert, Mrs. S., Piccadilly	Black Orpingtons	66	976

\* Failed under Regulation 12.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of February, 1921, and the average annual rainfall.

Station.	For Feb., 1921.	To end Feb., 1921.	Av'ge. to end Feb.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.				
Oodnadatta .....	1.74	1.74	1.34	4.73
Marree .....	0.23	0.23	0.04	6.02
Farina .....	0.35	0.35	1.07	6.57
Copley .....	0.65	0.68	1.16	8.30
Beltana .....	1.39	1.62	1.42	8.93
Blinman .....	1.53	1.64	1.77	12.52
Tarcoola .....	6.57	7.42	0.93	7.33
Hookina .....	1.48	3.74	0.99	12.65
Hawker .....	3.79	5.78	1.10	12.37
Wilson .....	3.74	5.20	1.17	11.85
Gordon .....	4.20	6.81	1.23	10.43
Quorn .....	5.66	7.89	1.19	13.79
Port Augusta .....	3.57	5.62	1.00	9.42
Port Augusta West .....	3.03	5.15	0.87	9.36
Bruce .....	2.87	4.68	1.04	9.99
Hammond .....	3.07	4.72	1.23	11.36
Willemington .....	3.97	6.01	1.38	18.06
Willowie .....	2.34	4.23	1.08	11.82
Melrose .....	6.00	7.87	2.07	23.11
Booleroo Centre .....	2.63	4.56	1.37	15.61
Port Germein .....	3.36	6.11	1.07	12.65
Wirrabara .....	3.46	5.53	1.29	19.44
Appila .....	1.47	3.08	0.69	14.90
Craddock .....	3.19	4.99	1.18	10.82
Carrieton .....	2.06	5.08	1.33	12.34
Johnsburg .....	4.06	5.45	1.06	10.22
Eurelia .....	3.43	4.59	1.37	13.11
Orororo .....	5.02	7.30	1.62	13.42
Nackara .....	2.00	4.24	1.33	10.63
Black Rock .....	6.00	7.51	1.29	12.29
Ucoita .....	2.02	3.29	1.49	11.65
Peterborough .....	1.42	3.20	1.44	13.28
Yongala .....	1.61	3.18	1.36	14.13
LOWER NORTH-EAST.				
Yunta .....	3.16	4.18	1.30	8.40
Waukaringa .....	4.17	5.17	1.00	8.15
Mannahill .....	5.62	6.58	1.25	8.51
Cockburn .....	2.68	3.18	1.28	8.03
Broken Hill, N.S.W. .....	2.89	2.94	1.58	9.89
LOWER NORTH.				
Port Pirie .....	3.37	4.60	1.05	13.26
Port Broughton .....	2.91	5.03	1.07	14.13
Bute .....	2.53	4.35	1.05	15.55
Laura .....	1.97	3.77	1.32	18.12
Caltowie .....	2.22	4.28	1.32	17.02
Jamestown .....	2.08	3.46	1.25	17.56
Bundaleer W.Wks. .....	2.32	4.08	1.11	17.56
Gladstone .....	2.26	4.10	1.19	16.05
Crystal Brook .....	2.99	5.59	1.15	15.62
Georgetown .....	1.77	3.72	1.32	18.30
Narrid .....	2.67	3.72	1.12	16.43
Redhill .....	3.17	5.15	1.10	16.66
LOWER NORTH—continued.				
Spalding .....	2.39	4.07	1.20	1.20
Gulnare .....	2.22	3.87	1.21	1.21
Yacka .....	2.19	3.81	1.03	1.03
Koolunga .....	2.17	4.47	1.18	1.18
Snowtown .....	2.64	4.75	1.05	1.05
Brinkworth .....	1.77	3.99	1.00	1.00
Blyth .....	2.02	4.39	1.23	1.23
Clare .....	3.00	4.63	1.62	1.62
Mintaro .....	2.11	3.80	1.24	1.24
Watervale .....	1.76	3.75	1.59	1.59
Auburn .....	3.13	5.18	1.76	1.76
Hoyleton .....	1.87	3.36	1.24	1.24
Balaklava .....	1.81	3.72	1.21	1.21
Port Wakefield .....	1.87	3.69	1.17	1.17
Terowie .....	2.23	3.58	1.50	1.50
Yarowie .....	2.65	3.91	1.36	1.36
Hallett .....	2.20	3.55	1.28	1.28
Mount Bryan .....	2.76	4.30	1.16	1.16
Koorunga .....	2.13	3.49	1.45	1.45
Farrell's Flat .....	2.07	3.46	1.34	1.34
WEST OF MURRAY RANGE.				
Manoora .....	2.17	4.00	1.09	1.09
Saddleworth .....	2.50	4.03	1.41	1.41
Marrabel .....	2.83	4.46	1.23	1.23
Riverton .....	1.85	3.81	1.38	1.38
Tarlee .....	1.76	3.41	1.36	1.36
Stockport .....	3.11	5.31	1.24	1.24
Hamley Bridge .....	2.94	5.08	1.33	1.33
Kapunda .....	1.97	3.66	1.51	1.51
Freeling .....	1.56	3.41	1.31	1.31
Greenock .....	2.03	4.21	1.40	1.40
Truro .....	2.47	4.36	1.36	1.36
Stockwell .....	1.77	3.60	1.37	1.37
Nuriootpa .....	1.54	3.67	1.37	1.37
Angaston .....	1.73	3.94	1.41	1.41
Tanunda .....	1.21	3.37	1.46	1.46
Lyndoch .....	1.13	3.44	1.34	1.34
Williamstown .....	1.15	3.40	1.51	1.51
ADELAIDE PLAINS.				
Mallala .....	1.20	2.93	1.27	1.27
Roseworthy .....	0.51	2.67	1.25	1.25
Gawler .....	1.66	3.20	1.37	1.37
Two Wells .....	0.59	1.97	1.19	1.19
Virginia .....	0.94	2.36	1.26	1.26
Smithfield .....	0.55	2.15	1.17	1.17
Salisbury .....	0.59	2.02	1.36	1.36
North Adelaide .....	0.44	2.48	1.37	1.37
Adelaide .....	0.55	2.14	1.36	1.36
Glenelg .....	0.24	1.76	1.22	1.22
Brighton .....	0.38	2.40	1.41	1.41
Mitcham .....	0.28	2.13	1.42	1.42
Glen Osmond .....	0.20	1.74	1.58	1.58
Magill .....	0.25	1.97	1.56	1.56

## RAINFALL—continued.

Station.	For Feb., 1921.	To end Feb., 1921.	Av'ge. to end Feb.	Av'ge. Annual Rainfall	Station.	For Feb., 1921.	To end Feb., 1921.	Av'ge. to end Feb.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.					WEST OF SPENCER'S GULF—continued.				
Wore Gully.....	0-32	2-19	1-60	27-73	Port Lincoln.....	0-55	1-37	1-06	19-83
Irving West.....	0-35	2-47	2-50	46-82	Tumby.....	0-51	1-91	0-66	14-76
Mulla.....	0-41	2-58	2-24	44-49	Carrow.....	0-67	2-53	1-06	15-14
Arndon.....	0-09	2-09	1-89	33-18	Arno Bay.....	1-27	2-69	0-84	13-10
Arboret Vale.....	0-11	2-24	1-44	22-90	Cleve.....	4-77	6-67	—	11-66
Wichinga.....	0-11	2-38	1-24	20-21	Cowell.....	2-77	4-13	0-87	11-84
Wichinga.....	0-54	2-29	1-48	25-82	Point Lowly.....	3-11	5-84	1-18	—
Wichinga.....	0-03	1-75	1-18	20-22	Kimba.....	4-01	—	—	—
Wichinga.....	0-87	2-24	—	—					
Wichinga.....	0-41	2-51	1-17	20-53	YORKE PENINSULA.				
Wichinga.....	0-29	2-56	1-22	22-93	Walleroo.....	3-45	4-75	0-97	14-11
Wichinga.....	1-84	4-50	1-51	27-01	Kadina.....	2-98	4-55	0-92	15-93
Wichinga.....	1-45	3-74	1-72	29-43	Moonta.....	2-75	4-08	0-96	15-31
Wichinga.....	1-16	3-41	1-82	33-33	Green's Plains.....	1-79	3-64	0-88	15-75
Wichinga.....	0-89	2-86	—	—	Maitland.....	2-14	3-33	1-10	20-20
Wichinga.....	0-61	3-06	1-76	35-60	Androssan.....	0-84	1-87	0-91	13-96
Wichinga.....	0-42	2-60	1-79	32-05	Port Victoria.....	1-42	2-83	0-88	15-34
Wichinga.....	2-32	4-27	1-78	34-81	Curramulka.....	0-21	1-34	1-02	18-31
Wichinga.....	0-67	2-59	1-81	28-58	Minlaton.....	0-19	1-88	0-91	17-70
Wichinga.....	0-52	2-33	1-89	31-10	Brentwood.....	0-28	1-81	0-72	15-44
Wichinga.....	0-52	2-25	1-84	32-94	Stansbury.....	0-20	1-43	1-01	17-08
Wichinga.....	0-57	2-12	1-66	30-60	Warooka.....	0-18	1-78	0-93	17-74
Wichinga.....	—	1-71	1-84	36-26	Yorketown.....	0-15	1-77	0-90	17-29
Wichinga.....	0-50	2-09	1-39	19-28	Edithburgh.....	0-09	2-01	0-96	16-58
MURRAY FLATS AND VALLEY.					SOUTH AND SOUTH-EAST.				
Leangie.....	0-48	1-78	1-22	18-77	Cape Borda.....	0-03	0-31	1-17	24-96
Leangie.....	0-79	1-98	1-21	15-56	Kingscote.....	0-14	1-72	0-97	18-82
Leangie.....	1-86	3-08	0-99	14-59	Penneshaw.....	0-16	2-01	1-68	21-39
Leangie.....	1-00	2-59	1-26	14-82	Victor Harbor.....	0-94	2-26	1-44	21-56
Leangie.....	0-63	2-37	1-09	14-55	Port Elliot.....	0-33	1-87	1-38	20-00
Leangie.....	1-56	3-16	1-10	13-98	Goolwa.....	2-99	4-49	1-40	17-87
Leangie.....	0-43	1-90	1-28	15-45	Karoonda.....	0-52	1-36	—	—
Leangie.....	0-76	2-53	0-95	11-51	Mindarie.....	1-03	1-93	—	—
Leangie.....	0-95	2-79	1-05	15-23	Meribah.....	2-21	3-97	—	—
Leangie.....	1-36	3-21	1-04	12-07	Pinnaroo.....	2-88	4-24	1-42	15-57
Leangie.....	2-75	3-76	1-04	10-80	Parilla.....	1-00	1-84	0-87	14-02
Leangie.....	1-73	2-48	1-07	10-26	Lameroo.....	1-53	2-49	1-18	16-45
Leangie.....	2-16	3-06	1-31	17-51	Parrakie.....	1-02	1-77	0-96	14-42
Leangie.....	0-76	2-05	0-81	10-90	Geranium.....	0-98	1-83	0-98	16-24
Leangie.....	2-66	4-81	0-91	9-13	Peake.....	3-24	5-09	1-15	16-25
Leangie.....	3-01	5-49	1-14	9-41	Cooke's Plains.....	1-35	3-02	0-99	15-00
Leangie.....	1-96	3-41	1-12	11-11	Coomandook.....	1-35	2-52	1-00	17-75
Leangie.....	2-01	3-41	1-50	12-27	Coonalpyn.....	0-25	1-44	1-26	17-64
Leangie.....	2-89	5-31	1-16	10-92	Tintinara.....	0-41	2-06	1-12	18-83
WEST OF SPENCER'S GULF.					Keith.....	2-57	3-63	1-22	18-54
Leangie.....	2-26	4-84	—	—	Bordertown.....	0-82	2-11	1-37	19-52
Leangie.....	0-04	0-11	1-24	10-03	Wolsley.....	0-92	2-50	1-15	18-07
Leangie.....	0-35	0-35	0-99	9-24	Frances.....	1-31	2-32	1-29	20-10
Leangie.....	0-78	0-83	0-89	12-11	Naracoorte.....	2-24	3-47	1-46	22-53
Leangie.....	2-09	2-14	1-14	12-26	Penola.....	0-40	1-50	1-84	26-48
Leangie.....	2-30	2-49	0-83	10-47	Lucindale.....	0-64	1-56	1-28	22-93
Leangie.....	2-68	2-90	0-78	10-37	Kingston.....	0-42	1-49	1-35	24-51
Leangie.....	2-83	2-90	0-81	12-97	Robe.....	—	1-16	1-45	24-60
Leangie.....	3-35	3-48	0-92	15-09	Beachport.....	0-39	1-21	1-74	27-29
Leangie.....	2-02	2-38	0-80	15-35	Millicent.....	0-43	1-62	1-90	29-29
Leangie.....	0-55	0-79	0-83	16-37	Kalangadoo.....	0-44	1-93	—	—
Leangie.....	0-35	1-91	—	—	Mount Gambier.....	0-51	1-57	2-42	31-65



## AGRICULTURAL BUREAU REPORTS.

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Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Mar.	April.			Mar.	April.
Alawoona .....	*	—	—	Frances .....	728	—	30
Aldinga .....	*	—	—	Freeling .....	*	—	—
Amyton .....	*	—	—	Gawler River .....	*	21	25
Angaston .....	*	—	—	Georgetown .....	*	19	16
Appila-Yarrowie .....	*	—	—	Geranium .....	*	—	30
Artherton .....	*	—	—	Gladstone .....	712	—	16
Ashbourne .....	726	21	25	Glencoe .....	*	—	—
Balaklava .....	*	12	9	Glossop .....	719	—	—
Barmera .....	719	—	—	Goode .....	*	23	20
Beetaloo Valley .....	*	23	20	Green Patch .....	†	21	18
Belalie North .....	*	19	16	Gumeracha .....	*	21	25
Berri .....	719	23	20	Halidon .....	*	—	—
Big Swamp .....	*	—	—	Hartley .....	720	23	20
Blackbeath .....	†	19	16	Hawker .....	*	22	19
Black Springs .....	*	—	—	Hilltown .....	*	—	—
Blackwood .....	†	21	18	Hookina .....	708	24	21
Blyth .....	709	19	23	Inman Valley .....	*	—	—
Booleroo Centre .....	711	18	22	Ironbank .....	*	19	16
Borrika .....	*	—	—	Julia .....	*	—	—
Bowhill .....	*	—	—	Kadina .....	*	—	—
Brentwood .....	*	24	21	Kalangadoo .....	*	12	9
Brinkley .....	714	19	16	Kanmantoo .....	*	19	16
Bundaleer Springs ..	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	22	19	Kilkerran .....	*	24	22
Butler .....	*	21	25	Kimba .....	*	—	—
Caltowie .....	*	—	—	Kingscote .....	*	—	—
Canowie Belt .....	*	—	—	Kingston-on-Murray ..	*	—	—
Carrow .....	*	24	22	Kongorong .....	†	24	22
Cherry Gardens .....	*	22	19	Koonibba .....	*	24	22
Clanfield .....	*	—	—	Koppio .....	*	21	18
Clare .....	713	1	5	Kybybolite .....	*	24	21
Clarendon .....	*	21	18	Lake Wangary .....	713	19	16
Claypan Bore .....	*	23	20	Lameroo .....	714	—	—
Cleve .....	*	23	20	Laura .....	*	18	22
Collie .....	*	—	—	Leighton .....	*	—	—
Colton .....	*	—	—	Lenswood and Forest Range .....	725	19	16
Coomandook .....	*	18	29	Lone Gum .....	719	—	—
Coomalpyne .....	*	—	—	Lone Pine .....	713	—	—
Coonawarra .....	*	—	—	Longwood .....	720	—	—
Coorabie .....	*	—	—	Lorton .....	*	—	—
Cradock .....	*	—	—	Lucindale .....	*	—	—
Crystal Brook .....	711	19	16	Lyndoch .....	*	24	21
Cummins .....	*	19	23	MacGillivray .....	*	23	20
Cygnet River .....	*	24	21	Maitland .....	*	5	2
Dawson .....	*	—	—	Mallala .....	*	7	4
Denial Bay .....	*	—	—	Mangalo .....	*	—	—
Dowlingville .....	*	—	—	Mantung .....	*	—	—
Edillilie .....	*	19	30	Meadows .....	*	23	20
Elbow Hill .....	†	—	23	Meningie .....	*	—	—
Eurelia .....	*	—	—				

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Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Mar.	April.			Mar.	April.
Meribah .....	*	23	20	Redhill .....	*	—	—
Millang .....	*	12	9	Renmark .....	715	—	22
Millcent .....	*	6	2	Riverton .....	*	—	—
Miltalie .....	†	19	16	Riverton (Women's) .....	*	—	—
Mindarie .....	*	7	4	Roberts and Verran..	*	21	18
Minlaton .....	*	18	22	Rosedale .....	*	—	—
Minnipa .....	*	—	—	Roxy Pine .....	*	16	20
Mintaro .....	*	19	16	Saddleworth .....	*	—	—
Monarto South .....	715	—	—	S a d d l e w o r t h	*	—	—
Mo n t a .....	*	18	22	(Women's) .....			
Moorak .....	726	—	—	Salisbury .....	*	1	5
Moorlands .....	*	—	—	Salt Creek .....	*	—	—
Moorook .....	*	—	—	Sandalwood .....	*	—	—
Morebark .....	708	—	16	Sherlock .....	*	—	—
Morgan .....	*	—	—	Shoal Bay .....	*	—	—
Morpbett Vale .....	*	24	22	Smoky Bay .....	713	19	16
Mount Barker .....	*	23	20	Spalding .....	*	—	—
Mount Bryan .....	712	—	—	Stockport .....	*	—	—
Mount Bryan East ..	*	—	—	Strathalbyn .....	*	22	19
Mount Compass .....	*	—	—	Talia .....	*	14	11
Mount Gambier .....	727	12	9	Tantanoola .....	*	—	—
Mount Hope .....	*	19	16	Taplan .....	*	—	—
Mount Pleasant .....	725	—	—	Tarcowie .....	*	22	19
Mount Remarkable ..	*	—	—	Tatiara .....	*	19	16
Mundalla .....	*	23	20	Two Wells .....	712	—	—
Mundoora .....	*	21	25	Uraidla and Summert'n	*	7	4
Murray Bridge .....	*	—	—	Veitch .....	*	—	—
Mypolonga .....	726	23	20	Waikerie .....	*	—	—
Myponga .....	*	—	—	Wall .....	*	—	—
Nantawarra .....	*	24	21	Wanbi .....	*	—	—
Naracorte .....	*	12	9	Warcowie .....	*	—	—
Narridy .....	*	12	9	Warrow .....	*	—	—
Narrung .....	*	19	23	Watervale .....	713	—	—
Netherton .....	*	—	—	Wepowie .....	*	19	16
North Booborowie ..	*	—	—	Whyte-Yarcowie .....	*	—	—
North Bundaleer ..	*	—	—	Wilkawatt .....	*	19	16
Northfield .....	*	16	13	Williamstown .....	*	—	—
Nunkeri and Yargo ..	*	6	2	Willowie .....	*	23	20
O'Loughlin .....	*	23	20	Wilmington .....	708	23	20
Orroroo .....	*	—	—	Wirrabara .....	711	—	—
Parilla .....	*	—	—	Wirrega .....	*	—	—
Parilla Well .....	*	21	25	Wolowa .....	*	—	—
Parrakie .....	*	—	—	Woodleigh .....	*	—	—
Paruna .....	*	—	—	Woodside .....	*	19	16
Paskeville .....	†	22	19	Wudinna .....	*	—	—
Penola .....	727	6	2	Wynarka .....	*	—	—
Penong .....	*	19	23	Yabmana .....	*	—	—
Petina .....	713	26	30	Yacka .....	*	22	19
Pine Forest .....	713	15	19	Yadnarie .....	†	24	20
Pinnaroo .....	*	18	22	Yallunda .....	*	—	—
Pomppoota .....	*	—	—	Yaninee .....	*	—	—
Port Broughton .....	*	18	22	Yeelanna .....	†	19	16
Port Elliot .....	†	19	16	Yongala Vale .....	*	18	22
Port Germem .....	†	19	16	Yorke town .....	*	—	—
Port Pirie .....	712	—	—	Younghusband .....	*	24	21
Ramco .....	†	21	18				

\* No report received during the month of February. † Held over until next month.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

HOOKINA (Average annual rainfall, 12in.

January 27th.—Present: eight members.

PREVENTING SANDY SOIL FROM DRIFTING.—Mr. J. Barnes read a paper on this subject, and, in the discussion that followed, Mr. G. Heneschke thought the best practice to adopt was to remove every other furrow from the plough and work the land early in the season. Mr. J. Barnes did not think it was advisable to use a disc implement on soil that was inclined to drift as it made the surface of the land too level. If there was from 4in. to 6in. of sand covering a clay subsoil, he would work the plough at such a depth that it would mix the clay and the sand together. Mr. B. Murphy said that, during most of the seasons, the sandy land grew the best crops in their district. He suggested fallowing to a medium depth with a furrow plough and sowing the seed early in the season.

MORCHARD (Average annual rainfall, 13.50in.).

November 20th.—Present: 20 members.

DESTRUCTION OF NOXIOUS WEEDS.—In a paper dealing with this subject, Mr. E. J. Kitto said the destruction of noxious weeds was a very important matter, and one which should receive the earnest attention of all landholders, district councils, and all co-operative bodies. The best time to deal with the weeds was when they first made their appearance. It was only so much waste time cutting up the weeds when they were dry enough to burn. There were many plants under the Noxious Weeds Act, and it was the duty of every farmer to keep his property free from them. The weed known as "Salvation Jane" had been the cause of a good deal of controversy; some people declared that the plants were good for fodder, whilst others contended that it was a noxious weed. He always made a practice of destroying as many of the plants as possible, because the land that it occupied could be more profitably used with other fodders. He was of the opinion that the White Stemless Horse Thistle would, if not checked, spread over a large part of the country. The plants produced a great number of seeds, which were light and feathery, and thus carried all over the country by the winds. The simultaneous destruction of rabbits and sparrows was often practised, and he believed that the same method of eradication should be adopted in the case of the weeds. The farmers were greatly handicapped in the matter, because of the large number of weeds that grew on waste lands, such as the stock roads and township blocks. He thought it would be a good plan if the stock roads were cut up into convenient blocks and leased for cultivation. The present 20-chain road could be reduced to a road three chains wide. An interesting discussion followed.

WILMINGTON (Average annual rainfall, 18.26in.).

February 16th.—Present: 14 members.

THE BLOWFLY PEST.—Mr. B. Jericho read the following paper:—Members will agree that this subject deserves the serious attention of every sheepowner. The fly and its work is so well known to all that it needs little description. The destructiveness of the fly has become more apparent during the past 12 years than before. It breeds particularly numerous in wet seasons and in districts where

bush feed and undergrowth are in abundance; consequently its damaging work is much worse in some years than others. I have collected a few so-called remedies from various sources:—Remedy (1)—Dissolve 2lbs. arsenic and one packet dip powder, and mix the two into about 30galls. water. This quantity should be sufficient to treat 900 grown sheep. Apply with a syringe or pump. The affected sheep can be held in a narrow race, and need not be handled separately. The remedy is lasting for more than two months. It should not be too freely used on rams' heads or very open wounds. The mixture is inexpensive. Remedy (2)—Mix 1gall. phenyl into 6galls. water, and add two spoonfuls of turpentine to every gallon of mixture. Apply with a swab or brush where affected. This mixture is harmless. Remedy (3)—Flimagol, 1gall. to 7galls. water. Apply in the usual way where affected. This has successfully been used by sheepowners where other remedies failed, and users recommend adding a packet of sheep dip dissolved in water. The remedy is harmless on any sores, and is suitable for wounds on rams' horns and heads. One gallon flimagol costs about 7s. No lasting remedy for the pest has yet been discovered, neither has any specific given protection for more than three months, and, according to Queensland reports, the use of arsenical preparations has proved most successful and lasting. Great care should be exercised when handling arsenic. It has been proved that flies do not travel any great distance. They usually work in districts where they can enjoy dampness of soil, plenty of green feed, and undergrowth for shelter. Apparently they do not prosper in dry areas. Jetting lambing ewes with a good mixture, say, two months prior to lambing, is highly recommended. For this either number one or number four mixture is the best, and it tides the ewes over the lambing season. Jet or spray a good mixture into the wool at the crutch and around the rump. Use a narrow race for this purpose, taking one sheep at a time. One boy can keep up the sheep, and another cheek too fast a run. The man jetting can place himself lower than the race and sheep in order to get a good view. By this method I have known two boys and a man treat 1,100 affected sheep, with good results, in one day. Men with affected sheep must act quickly to obtain good results, and it is better to treat sheep not blown in a flock than to wait for the fly to begin its work before doing anything. Nothing moist and damp appears secure from this pest, and in consequence, should they increase, very rigid methods will have to be adopted for its destruction. In the discussion that followed, Mr. Farrell stated that he had used successfully on affected ewes and rams a composition named flimagol, in proportions of one to six parts of water. It is soothing to an open wound, and it would keep away the blowfly for 10 to 12 weeks. Mr. Linklater recommended arsenical mixtures of 3lbs. arsenic, one packet sheep dip, each dissolved thoroughly, and mixed into 35galls. water. The solution should be applied to the affected parts by means of a hand spray pump. The above quantity should treat about 800 sheep. A small quantity of phenyl could be added to advantage, and the treatment should last about 10 weeks.

### MIDDLE-NORTH DISTRICT.

#### (PETERBOROUGH TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16.46in.).

January 22nd.

SUMMER CULTIVATION.—Mr. C. Dutton read the following paper:—"It is most important to keep a surface mulch on the fallow during the heat of the summer, in order to prevent the evaporation of soil moisture by breaking the connection between the surface layer and the soil beneath. Although the mulch should be reformed as soon as possible after its effectiveness has been destroyed by rain, nothing is to be gained by working the soil beforehand, unless of course it is done with the object of killing weeds. If the land is cultivated before it is necessary, the soil works into such a fine condition that it assists, rather than retards, evaporation. A coarse mulch remains effective longer than a fine one, so that no attempt should be made at this time to reduce the soil to a fine tilth. The working of the soil also induces weed seeds to germinate, and then later kills them. If they are allowed to grow they will take plant food as well as moisture from the

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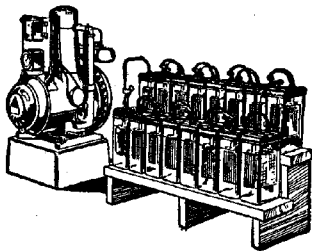
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ground. The stirring of the soil also increases the surface exposed to attack by chemical action, and so more plant food is made available for the coming crop. The work is carried out with different types of harrows and cultivators. No hard and fast rule can be laid down as to which implement should be used, the farmer being guided by the physical condition of the soil. If the surface is not very firm and the land is practically clean of weeds, the tine harrow can be used cheaply and with advantage. Again, if the soil is set, it is necessary to call upon the ordinary time or spring tooth cultivator, and if very weedy, a disc cultivator, which chops the weeds out of the ground, does not block, and leaves the soil in a fine condition. But it is because of this fine condition to which the disc cultivator reduces the soil that many farmers are against its use. The one way disc cultivator would prove a very useful implement on the majority of fallows in this district this year, but, generally speaking, the work can be satisfactorily carried out with the tine harrow and cultivator. When the farmer has certain noxious weeds growing on his fallow, such as artichokes, Bathurst burr, castor oil plant, Scotch thistles, &c., he cannot do better than take a pick and grub them out, because the implements generally used for working the fallow will not deal with them satisfactorily. In regard to the depth of the mulch, 1in. or 2in. to 3in. deep is deemed to be the most economical. Sheep on the fallow at this time of the year are very useful; in fact, a farmer can hardly do without them, especially in a year like the present. The farmer is prevented from working his fallow during the summer owing to harvest operations, but by running sheep on the fallow they will keep it fairly clean of weeds, and at the same time their deposits help to fertilise the land and add humus to the soil which cannot be supplied artificially by any other economical way. There is a disadvantage in running sheep on the fallow when they are allowed into adjoining paddocks where noxious weeds are seeding, because the sheep will collect seeds, and when put back on to the fallow will distribute them wherever they go. As soon after harvest as possible the farmer should, in my opinion, renew the surface mulch and clear his land of weeds, lest many of the advantages of good fallow be lost. Although sheep are very useful on the fallow, they cannot cultivate it, hence the importance of that point."

WIRABARA (Average annual rainfall, 18.91in.).

February 19th.—Present: 21 members.

**HORSE DRIVING.**—Mr. F. C. Carson, who contributed a paper on this subject, said the horse was one of the most intelligent animals on the farm, and if the farmer treated the animals kindly they would work with more satisfaction than if they were maltreated. The horse was not deaf, and would perform his work just as well when spoken to in a soft and kind voice. Regular feeding and watering times should be adopted, and a practice should be made of grooming the shoulders. Well-fitting harness and wide trees and spreaders should be used to prevent the chains from chafing their sides. The speaker also advised trimming the tails in April, so that the hair might grow long enough to enable the horses to defend themselves against flies. The writer favored working the teams on the tandem principle. For one reason, it enabled the implements to work closer into the fence, and the team and machine could be taken from one field to another without any loss of time. An interesting discussion followed, and the views expressed in the paper were supported by members.

**BOULEROO CENTRE, February 18th.**—Several items of local interest were brought before the meeting, and matters connected with the proposed Mid-Northern Conference were discussed.

CRYSTAL BROOK, January 22nd.—The Secretary of the experimental plots (Mr. J. Pridham) presented a report of the work done during the year 1920. Very satisfactory results were secured from new wheats introduced into the district by the plots committee. At present the Carrawa, Florence, and Warren varieties were much favored and extensively grown. During 1920, 32 varieties were experimented with. Eight plots of  $\frac{1}{2}$  acre were sown, and 24 varieties, of which only small quantities of seed were available, were sown in rows with a drill with alternate rows blocked up. Seeding was done at the rate of 1bush. of seed to 27lbs. of super per acre, sown on May 22nd, under favorable conditions of weather in ground that had been fallowed and well worked. Boadicea, Canberra, Bungey, Mesopotamia, and No. 8 were selected as the best hay wheats.

GLADSTONE, February 19th.—The meeting was devoted to a discussion of matters connected with the forthcoming Conference of Mid-Northern Branches of the Agricultural Bureau, to be held at Gladstone on March 8th.

MOUNT BRYAN, February 8th.—The meeting took the form of a social evening to say farewell to the Chairman (Mr. J. Thomas), who intends leaving the district for an extended holiday.

PORT PIRIE, January 22nd.—Mr. L. C. Roberts read a paper, "Interesting Experiences of an Agriculturist Abroad." Matters relating to the forthcoming Mid-Northern Conference were also discussed.

### LOWER-NORTH DISTRICT.

#### (ADELAIDE TO FARRELL'S FLAT.)

TWO WELLS (Average annual rainfall, 16.36in.).

January 24th.—Present: 11 members and visitors.

MILK VERSUS CREAM.—Mr. G. M. Cordon in a paper on this subject, said in working comparisons between the value of milk and cream, much depended on the breed of cow. The Jersey was not generally known as a milk-producing cow, while on the other hand the Holstein did not have the reputation of giving heavy yields of cream. The class of feed also affected the production of the cream. Certain foods had more producing powers than others. A bulk of feed might produce an abundance of milk, but it was quite possible that the product would not possess much butter fat. The Jersey cow was undoubtedly the best cow for producing cream. With a herd of 20 cows each animal should be capable of producing, during a milking period of nine months, the following yields:—4galls. a day for first and second months, 3galls. a day for third, fourth, and fifth months, 2½galls. a day for sixth month, 2galls. a day for seventh month, 1gall. a day for eighth month, ½gall. a day for ninth month; total, 690galls. a year each. Milk:—690galls., at 1s. 1½d., £38 2s. for each cow, or £762 for the 20 cows. Cream:—320lbs. butter, at 2s. 6d. lb., £40 for each cow, or £800 for the 20 cows, making a difference of £38 a year in the returns. These figures might appear to be high when one considers that there were hundreds of cows in the State to-day not producing half that quantity; but they by no means constituted a record, and, while one might not be able to average it with the whole herd, it would be a good goal to aim at. Again, the advantages of cream allowed the farmer to rear the calves on the separator milk, which, after due allowance was made for labor for feeding same, was practically all profit. Pigs could also be fattened, and during the last two years they had been a paying proposition, owing to the exceptionally high prices for pork. With the addition of a little corn to the separator milk a large profit could be made from the pigs. By purchasing suckers for £1 10s. to £2, and keeping them for, say, four months, they could be sold for £5 or over. Allowing for corn used for topping off, it would be found that the profit on each pig amounted to close on £3. The milk from two cows would keep one pig, therefore with a herd of 20 cows one should be able to turn over, approximately, 30 pigs a year. That meant about £80 a year, after allowing for all expenses. With calves, independent of those kept for the herd, a large profit could be made. Allowing five calves for maintaining the herd annually, that would leave 15 calves for fattening for market. A good calf, from six weeks to eight weeks old, would realise on an average about £1 1s.; 15 calves would amount to £22 10s. That was practically all profit, as the calves could be all reared on separator milk. The financial result of a herd of 20 cows would be as follows:—"The man who sells his milk receives £762 for the year. The man who sells his cream receives £800 for his cream alone, £80 a year from his pigs, and £22 10s. from his sale of calves, amounting to £902 10s. for his full income, which means that he receives £140 10s. over and above his neighbor who sells his milk. These facts and figures prove that cream is by far the better proposition."—Mr. C. C. Rossiter read a paper, "Milk Production," in which he traced the progress of the dairying industry during the last 10 years. Mention was made of the necessity for providing

reserve stacks of fodder for the stock. The writer also made a strong point of the need for clean and sanitary methods when handling the products of the dairy. An interesting discussion followed the reading of the papers.

CLARE, January 15th.—Members visited the homestead of Mr. R. Hunter, and an inspection was made of the orchard and vineyard, and discussions took place on various topics connected with orchard work, after which the members were entertained by Mr. and Mrs. Hunter to afternoon tea.

LONE PINE, January 27th.—Mr. T. Fromm read a paper, "Qualifications of a Farmer," and a lengthy and interesting discussion followed.

WATERVALE, February 7th.—Matters relating to the forthcoming Conference of Lower Northern Branches were brought forward, and the delegates were elected. A general discussion also took place on "Fruit Drying."

### YORKE PENINSULA DISTRICT.

(TO BUTE.)

PINE FOREST, February 15th.—Several matters of local interest were brought forward, and the delegates to the meeting of the Northern Yorke Peninsula Field Society were appointed.

### WESTERN DISTRICT.

LAKE WANGARY.

January 22nd.—Present: 10 members.

INCREASING THE OUTPUT OF THE FARM.—Mr. A. McEvoy contributed a paper on this subject. He was of the opinion that the farmers in that district should cultivate the land for feeding the stock, rather than for growing corn of any kind, because a large enough crop could not be grown to pay for the present high price of farm labor and implements. He would grow crops such as oats, peas, or barley, because they would carry a greater number of sheep on the same area. During the latter part of the winter feed was plentiful, but after it dried off there was not the substance in it to keep the stock fat for any length of time, but if they could be turned into a ripe crop they could be kept in prime condition, and the land would carry twice the number of sheep per acre. That would obviate not only the expense of buying cornsacks, but a good crop of oats could be grown without superphosphate. Every farmer should cut about 100 tons of oaten hay, as a standby in case the stock would need hand feeding. About 10 cows, he said, should be kept on every farm, and the calves should be taken care of. If properly fed, each cow would produce butter to the value of about £10 per year. Pigs and poultry were also a profitable sideline. He thought every farmer could with advantage have a small irrigation plot, say, about half an acre of lucerne, to provide a sufficiency of green feed for the cows. He suggested breeding two foals each year, but he would not keep any horse that would not realise £20 at three years of age, nor would he keep any idle or useless horses on the farm. A good discussion followed the reading of the paper, the majority of members agreeing with the views of the writer. Mr. P. Puckridge suggested lambing ewes in February on a crop of oats, the advantage being that the lambs would be dropped before the cold weather set in. During the winter months sufficient oats should be provided to carry the ewes and lambs until the appearance of green grass. The lambs would also develop into larger sheep, and would give a greater return of wool at first shearing. Messrs. W. Shepperd, F. Puckridge, and several other members also spoke on the subject.

PETINA (Average annual rainfall, 13.19in.).

January 29th.—Present: 12 members.

PRESENTATION OF LIFE MEMBERSHIP CERTIFICATE.—After the business of the Branch had been transacted, Mr. E. Keeley presented to Mr. W. Penna a life membership certificate of the Agricultural Bureau. Mr. Keeley suitably responded.

SMOKY BAY, January 22nd.—Several matters of local interest, including water supplies and wheat freights, were brought before the meeting for discussion.



**EASTERN DISTRICT.**  
(EAST OF MOUNT LOFTY RANGES).

**BRINKLEY.**

February 19th.—Present: 12 members.

**HARVEST REPORTS.**—Mr. H. D. Humphrey reported having grown Lotts averaging 8 bags, Budds 4 bags, and Marshalls 5 bags; hay about  $1\frac{1}{2}$  tons per acre. Mr. E. W. Pearson's crop of 350 acres of wheat averaged 15bush, hay  $1\frac{1}{2}$  tons, and oats 20bush. Mr. Wilhelm reported an average yield of 10bush., and hay  $1\frac{1}{2}$  tons. Mr. A. W. Richards stated that Budds, Gluyas, and Marshalls had averaged 12 bags: hay  $1\frac{1}{2}$  tons, and oats 15bush. On Mr. A. B. Martin's farm Clubhead, Federation, Marshalls, and Lotts had averaged 9bush. to the acre, hay  $1\frac{1}{2}$  tons, and oats 8bush. Mr. J. W. Humphrey reported having grown New Zealand Blue, Major, and Teacle's Red with an average of 12bush., oats 15bush., hay  $1\frac{1}{2}$  tons, and barley 18bush. All members were of the opinion that Budds was the best variety of wheat for the district.

**LAMEROO** (Average annual rainfall, 16.55in.).

November 27th.—Present: seven members.

**SUMMER CULTIVATION.**—In the course of a paper under the heading "Working Land with a View of Obtaining Better Fallow," the Hon. Secretary (Mr. W. J. Morcom) took as an example land that had been fallowed in July and August of the previous year. In many cases that land grew a very rank growth of weeds and other rubbish, which was very difficult to destroy. Such land could certainly be

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worked with a skim-plough or cultivator, but the trouble was that the weeds were out in seed, which meant that the land would be very dirty during the next seeding time. If the land had been cultivated during the summer, the weeds would have made a growth soon after the first rains, and, providing the farmer had sheep, they could be allowed to graze on the fallow. Land that had previously been cultivated worked up very much better during fallowing than land not so treated, for the soil was thoroughly turned over, more weeds were buried, and if the harrows were worked immediately after the plough, the greater part of the rubbish would be destroyed. He was of the opinion that if they wished to have clean fallows, it was important that the land should be worked between harvest and seedtime. In the discussion that followed, Mr. Wray was of the opinion that extra working of the land was necessary to make the weed seeds germinate earlier in the year, in order that the farmer would have more time to deal with the rubbish. Members were agreed that some such method as that outlined by the speaker would have to be adopted, if farmers wished to keep the fallows free from weeds.

#### MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

January 23rd.—Present: 16 members and two visitors.

**HARVEST REPORTS.**—As customary at the first meeting after harvest, members brought in samples of wheat for weighing, to ascertain the average quality of the wheat of the district. Twenty-four samples were brought in, ranging from 66½lbs. to 57½lbs. per bushel, making an average of 62½lbs. per bushel for the district, which was considered a very good average, especially as several samples contained bleached grain. A programme of meetings for the period ending July 16th was then compiled.

#### RENMARK (Average annual rainfall, 10.93in.).

January 20th.—Present: 40 members.

**HARVESTING FRUIT.**—The following paper was read by Mr. O. Weste:—‘A great deal has been written on the subject of processing fruit grown along the Murray Valley in such a way as to make a marketable product of it. Yet each individual has ideas and methods differing perhaps in some slight degree from his predecessors, so that it is possible for us to learn a little from each. Within the last few years the drying of raisins and currants has undergone a great change, from the laborious handling of the wooden trays to the safer method of using wire-netting trays and racks. This newer method has not only raised the standard of quality, but has lessened the cost of harvesting, and reduced the waste to a minimum. Our fruit is now known by a name—‘Sunrayed’—and it is only by individual effort that we can maintain a standard whereby the name sells the fruit. Therefore, it is up to each individual to jealousy guard this name and make it acceptable above fruits of an unknown brand and standard. The Drying Green.—As this paper has been arranged for principally with a view of helping those who have recently taken up new land, and those who intend doing so, I cannot do better than start with the selection of a site for the drying green. Choose a spot easily accessible from all parts of the block, as a few minutes saved in haulage to and from the green will mean a big saving in the cost of harvesting in the course of years. Do not follow the example of some of our present-day growers and place the drying green on any old waste piece of land. Make a green of it literally to combat the sand nuisance, as nothing is more annoying, after going to pains to turn out a good sample, than to have the grade reduced on account of the fruit being sanded. Lucerne is the most useful plant to grow for this purpose. It is necessary for the green to be in such a position as to allow the racks to have a northerly and southerly direction, thereby getting the most use from the direct rays of the sun. Fruit on racks placed in this direction can be removed a day earlier than those having a western and eastern aspect. The Racks.—I prefer the construction of racks rather than the purchasing of an equivalent capacity in wire trays. The racks are less costly, and, if properly made, require little attention for many years. The most useful rack, when currants, sultanas, and leixias are to be harvested, is the 5ft. rack with four tiers, the bottom tier 1ft. 6in. from the ground and 14in. between the other three tiers. This space between tiers allows a dip tin to be freely used in spreading dipped fruit, and

gives plenty of elbow room for rubbing off the fruit when dry. Where more than one rack is to be constructed, a space of 13ft. should be allowed between the racks. This will enable you to spread two widths of hessian (which will hold all the fruit from the rack), at the same time allowing sufficient room for a trolley to pass between them in loading up the full sweats of dried fruit. The matter of rack covers has given rise to a great deal of controversy. The canvas covers are costly, and do not last long, and the galvanized iron covers are permanent, but costly. I have never used anything but my wooden trays to cover my racks, and can safely say that I have never lost any fruit in consequence. The majority of new blocks are from 14 acres to 15 acres in extent, and were I to lay out one of these, I should plant fruit which ripens in sequence, such as apricots, nectarines, and vines, or apricots and early prunes and vines; or apricots, peaches, and vines. In doing this you serve a dual purpose, one in enabling you to do as much of the harvesting work as possible yourself, and the other by utilising the trays which will form covers for the racks when the currants and raisins come on. It takes 300 trays to cover two 50-yard racks. You would require little more than this to harvest the crop from an acre of each of the above-mentioned fruits. When it becomes necessary to purchase harvesting material, start off with dip tins, and use only dip tins for all purposes. I found that by discarding boxes, and using only tins to pick into, I could do with one man less at the dip during the whole dipping period. Treatment of Vine Fruits.—I will now proceed with the treatment of the various fruits that are likely to come under our care, starting with vine fruits. The currant is the first to ripen, and is usually ready to pick during the first week in February. Picking should not commence before the fruit has a good sugar content, say 13deg. or 14deg. Beaume test. At this test the fruit can be relied upon to turn out a fine sample, provided, of course, it is treated properly. Spread the fruit on the rack, not more than one bunch thick, so as to form a carpet over the netting without showing any wire when spread. Place the tin with fruit in the netting, and give it a sweeping movement towards the centre in emptying out. In this way you will find that little handling is necessary afterwards. Cover the top of the rack with some form of roofing, so that the top tier is kept in the shade, the other tiers being shaded sufficiently by those directly above them. Side coverings are not necessary. The object of shading the currants is for the fruit to dry slowly, thereby ensuring a good dark color. Leave the fruit on the rack till the bunches dangling through the netting will not squash when squeezed; then rub off on to hessian. There are various ways of rubbing off, but I always use two pieces of tray boards, about 2ft. 6in. long by 2in. wide, using one above and one below the tier. Two layers of hessian will hold the four tiers of fruit. I find a convenient length for the Hessians is 7ft., as this allows of comfortable handling, and it is not too cumbersome. Draw the Hessians out, and spread them in the sun for a few days. This sunning has a tendency to counteract any trouble likely to occur from the weevil after it is boxed up and sent away. Of later years this trouble appears to be growing, and the indications seem to point to an insufficiency of sun during the drying process. The Dip.—The sultana, lexia, and malaga have always been dipped in this country, but not so in California, where grapes are still dried on old-fashioned 3ft. x 2ft. trays. Dipping causes the skin to crack, and not only allows it to dry more quickly, but makes a more attractive article than the undipped article. The dip must not be at a lower temperature than 200deg. Fahr. Sultanas and malagas require a dip with a strength of 15galls. to 20galls. of water to 1lb. of caustic soda, and the lexia needs 10 galls. to 12 galls. to 1lb. While the sultana and malaga can be given an "in-and-out" dip, the lexia needs immersion for about 3secs. The chief thing to bear in mind about any dipped fruit is to have the skins fairly cracked, and you get a good, even sample. With sultanas, malagas, and lexias, as with currants, a few days' sun is most necessary after removal from the racks. This takes away the greenish tinge which sometimes shows itself on shade-dried dipped fruit, and allows it to dry a good, clear amber color. The dipped fruit can be taken off the rack as soon as the stalks are brittle enough to break up and the fruit will rub without squashing. I use the same sticks as for currants for rubbing off. You will find that a day or two on hessian is enough to top-up, provided that you keep the fruit well stirred with a garden rake once or twice a day. Washing Sanded Fruit.—It sometimes happens that during the drying season we experience some nasty sandstorms, and no matter what precautions you take to protect the fruit, it gets gritty. We had

one last year, and about two tons of my lexias became badly sanded. As an experiment I again lit up my dip to a temperature of 100deg.; half filled each dip tin with fruit, and stirred it until every raisin had a good taste, after which I put them on hessian. In a day there were ready to box up again, having a gloss on them like a well-polished tan boot. The advantage of using the old dip in preference to clear water and a little caustic is that a good deal of the sugar juice of the grape gets into the dip in the dipping process, and this is what gives the fruit gloss. I dipped sanded pears in this way with very fair results, and I have no doubt it would improve any sanded fruit, so as to make a passable sample of what must otherwise be useless fruit. Stone Fruits.—Apricots are dried in two ways—cut and whole. The drying of cut apricots is a costly matter, and costs are still on the upgrade, so that in time to come, when prices are reduced there will be a very small margin left for the grower. Then it is that the whole-dried apricot will come into its own. Hitherto the sale of the whole apricot has been hampered by the rubbish that has been put on the market under this name, and I do not blame the public for fighting shy of it. Turn out an attractive looking article, and the housewife will buy it, as nothing is more attractive than a good whole-dried apricot. The cut fruit can be sulphured in about four hours, using about 1½ lbs. to 50 trays. Whole fruit, before being placed in the sulphur house, must be placed squarely on its side on the tray, and pricked with any pointed article. When a quantity is to be done, a flat board with small nails driven through it in squares of about an inch can be used. Just press this board down on top of the apricots, and you will find that each one gets a jab. This allows the sulphur to penetrate, and prevents blistering when drying. Some growers advocate dipping whole fruit to crack the skin, but this is rather messy and laborious compared with the above method. I use a frame (similar to that used for spreading currants on wooden trays) for spreading whole apricots, and tip the tin on to the tray, placing those that have not fallen right in position with the hand. As the color of the fruit depends on the sulphuring, you cannot be too careful about this. I give my whole fruit two sulphurings of about five hours each. By that time the fruit should feel soft wherever it is touched, and have a slightly milky appearance. On removal from the sulphur house it is best to leave the trays in the stack for a couple of days before putting out in the sun. I might also mention, while on the matter of whole apricots, the necessity of drying only firm fruit in this way; soft and over-ripe fruit becomes unsightly. Nectarines and peaches are cut and sulphured in the same way as the apricots. No hard and fast rule can be laid down as to the quantity of sulphur necessary for a given number of trays, as so much depends on conditions of temperature. The greater the heat, the less sulphur is used, and *vice versa*. Only one thing can guide you, and that is to see that the cups are well filled with juice. Having this, you will have the color you need. The Neglected Prune.—Before going into details about the treatment of prunes, I would like to say that this is a much neglected fruit in these parts, as, given the right varieties, heavy and consistent crops are grown at a very remunerative figure. Were I planting new land I would give prunes my earnest consideration. When the fruit ripens it falls on the ground, and there it can remain for several days in dry weather without harm. Do not under any consideration pick the fruit off the tree because it looks black, nor shake the tree, otherwise you will not have a good color in the finished article. As with the case of the whole apricot, the skin must in some way be pierced to allow the fruit to shrink evenly. One way is to tip the prunes on a chute, having pin points in squares of ½ in. projecting; they become pierced as they roll down, after which they can be put straight out on the trays to dry. Another method is to immerse them in a caustic dip, with a strength of 30 galls. water to 1 lb. caustic soda. The dip must be boiling, and the prunes held in for 10 secs, and then placed on trays in the ordinary way. When the fruit is dry, a second process is necessary to give it a gloss. This consists of a dip, made up of glycerine 1 pint, sugar 6 lbs., and water 20 galls. The prunes are again placed on trays for a day or so, after which they are ready for market. An Evaporator for Pears.—The more I have to do with pears, the more convinced I become that the most satisfactory way to dry pears is by means of an evaporator. There are years of good weather when an evaporator may not be necessary. There are also years when pears are the despair of those who have them. As few growers have enough pears to warrant the expense of an evaporator, I would like to see one of our

co-operative bodies go into the matter of costs, with a view to building a large capacity evaporator, and handling all our stray lots of pears. The Sulphur House. —There is, up to the present, no standardised sulphur house, nor have I seen any suggestions whereby economy is combined with stability for the construction of one. So I will throw out these suggestions for a two-section sulphur house, holding 60 trays in each section, which I am going to build shortly. It will be of reinforced lime concrete. The requirements are six 3in. x 3in. red gum uprights 7ft. long, placed 1ft. in the ground, 4ft. 6in. apart for the depth and 5ft. apart in the length. Bore holes in the posts 1ft. apart, and trellis the sides, back, and end with fencing wire. Now start from the top, and weave the wire in and out 1ft. apart till you reach the bottom, so that you have squares of a foot. Leave the whole of the front open for the door. Make the concreting boards by nailing packing case boards on to two 3in. x 2in. red gum pieces, so as to do about half the height, viz., 3ft., in one filling, and make them 5ft. long. This takes the width between posts, and will also do for the ends. Leave ends of wire protruding from side walls 1ft. apart, to which you join the wire for the roof. Wire the roof the same as the sides, and fasten together at the intersections with their tie wire. Prop up the concreting boards from underneath, and pour in the concrete, allowing it to set before removing boards. The result should be inexpensive and everlasting." In the discussion that followed, the Chairman (Mr. Basey) said he was one who used a piece of waste high land as a drying ground, and provided precautions were adopted to cope with the dust trouble, he considered the practice a good one. He saved a day or two in the drying because of the situation of the ground. The dust nuisance was a serious one, but the dust came mostly from the roads. To combat this his firm every year carted loads of weeds, straw, and other rubbish on to the road adjacent to the drying ground before the season started, and they also consistently spread the contents of the dip on the sand round the dip, which by this means set hard. He did not favor the four-tiered rack. To use four tiers only was a waste of space. His own racks had eight tiers, 8in. apart. The bottom one was used to catch the loose berries, and there were seven to spread on. By this means, with one set of posts, they served double the number of tiers, and the roof covered double the quantity of fruit. It was originally intended when these racks were built to use the eight tiers for currants, and to remove every second tier for sultanas, but the full set acted quite well for sultanas. They managed to spread the fruit all right, using a notched stick to hold the tiers apart while spreading. The spreading perhaps took longer than with the wide-spaced tiers, but the saving of capital expense much more than compensated for this. Mr. Alexander thought that 13ft. between the racks was not enough, and Mr. Basey preferred 15ft. as a minimum. Mr. Weste explained that he used three trays joined together in the intersection of the trays to check the fruit while rubbing off was in progress. He would not roll up the hessians except on dewy nights, but liked to roll up the night before boxing the fruit. Mr. Basey kept old, full-length hessians, which had been used for the sides, to pull over the fruit hessians at night. For rubbing off he found the back of a pitchfork much better than sticks. This was a great labor saver, whether with currants, sultanas, or lexias. In the matter of the whole-drying of apricots, Mr. Levien had tried both dipping and pricking, and, for uniform results, dipping was far the better practice. Mr. Muspratt had dried a number of samples dipped with different strength and for different lengths of time. These would be on show later. The samples of pricked fruit tabled by Mr. Weste were very good and well above the average; they were quite equal to dipped fruit. Undipped fruit was liable to puff, and blistered if dried in the sun. Dipped fruit—it might be dipped at any strength from one in ten to one in 20 if slightly cracked—dried quickly either in the shade or sun. Mr. Darrington said one of his neighbors had dipped all his apricots this year with good results. The fruit dried much more quickly than the undipped, and was off the trays in four days. Dipped fruit must be sulphured promptly after dipping. Mr. Basey was glad that the washing of sanded fruit had been mentioned. This was a practice far too much neglected. His firm had been washing pears for years with complete success, and they had even come to think that almost any fruit was improved by washing. All that was needed was to rinse it in a dip tin. At one time they used to scrub any sanded pears with a brush, but if the water was hot this was not necessary. The fruit only took an hour or two to dry in the sunshine afterwards. When in Adelaide,

Mr. Quinn had showed him samples of dried fruit which he had stopped being exported. They were in an appalling condition, shockingly graded, and very dirty. They were utterly unfit for export, and it was scandalous that anyone should have tried to export them, but if the fruit had been washed it would have been fit for something better than pigs, which was all it was fit for without washing. Mr. Weste stressed the statement that fruit selected for whole-drying must be firm.

BARMERA, January 28th.—Mr. W. Muspratt (Irrigation Instructor) delivered the second of a series of lectures, after which he answered several questions dealing with the treatment of fruit trees and vines.

BARMERA, February 18th.—Mr. W. Muspratt (Irrigation Instructor) gave the third of a series of lectures. The speaker dealt with the subject of "Fruit Drying."

BERRI, January 25th.—Capt. S. A. White, C.M.B.O.U. (member of the Advisory Board of Agriculture), visited the Branch and delivered a lecture, illustrated with lantern views, to a large audience. At the conclusion of the lecture, Mr. Norman presented Mr. S. Sterratt with a trophy presented by the Branch for the best block of not more than 5 acres in the district.

GLOSSOP, February 16th.—Mr. W. R. Lewis, of the Berri Branch, attended the meeting and read a paper, "Vegetable Growing". An interesting discussion followed, and the visitor replied to numerous questions.

LONE GUM, December 24th.—The meeting took the form of a Christmas festival, arranged for the benefit of the children, and the meeting proved a great success. At a meeting held on January 20th, the Manager of the Berri Co-operative Packing Shed (Mr. R. C. Downie) delivered a lecture, entitled "From the Rack to the Packing Shed," which was greatly appreciated by those present.

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**MYPOLONGA**, January 27th.—The meeting took the form of a tour of inspection. About 40 visitors were present, and after an inspection had been made of the pumping plant the party proceeded to the Institute, where lunch was provided. During the evening Mr. Manuel addressed the meeting on "The Future of the Dairying Industry."

### SOUTH AND HILLS DISTRICT.

**HARTLEY** (Average annual rainfall, 15in. to 16in.).

January 19th.—Present: seven members.

**MAKING FARM LIFE ATTRACTIVE**.—Mr. H. H. Cross read the following paper:—If we wish to make rural life attractive, it is my conviction that we must make provision for the enjoyment of the people in the country. There are so many fascinating and interesting games in which all classes can join that it seems a great pity that we do not take more advantage of them. The old folks seem to think that their days of pleasure are past, and that it is their duty to stay on the farm and attend to the work throughout the whole of the year. Bowls and croquet are two ideal games for the older people, and while as yet we have not greens for those games, I think the members of the Bureau can do much towards providing amusement along other lines for themselves and the fairer sex. For the young men the game of cricket has been followed with much enthusiasm; and the tennis courts should be better patronised by the ladies. I am quite convinced that if the farm hands were to take a keener interest in the functions of the country, and devote some of their time to pleasure, the craving for city life would be overcome. To a farmer with young boys, a good pastime in the evenings is billiards; the girls could indulge in music and singing. A social evening of neighbors also creates a good feeling, and helps to break the routine of farm work. The boys should be given an interest in the work of the farm—a share in the profits, or a piece of land sown on their behalf. The girls should be allotted a share of the profits from the cows and poultry. Farming can be made a pleasure, though the work is of necessity hard at times. Mr. J. Stanton also read a paper, "The Farmer."

**LONGWOOD** (Average annual rainfall, 37in. to 38in.)

January 22nd.—Present: 10 members and four visitors.

The monthly meeting of the Branch was held at the residence of the Hon. Secretary (Mr. J. R. Coles). Messrs. R. H. A. Lewis and W. P. Woolcock gave a demonstration of summer pruning. The Jonathan, Five Crown, and Shorland Queen varieties of apples did not require pruning, but Rome Beauties were benefited by that treatment on account of the numerous spaces along the arms.

After tea had been partaken of, Mr. Bevan Rake, who had attended a course of agricultural education in California, contributed a paper entitled "Impressions on Fruit Growing in California." He said "The fruit industry of California is much more developed, and better organized than that of any other State in America. The centre of the fruit-growing areas is on the corresponding latitudinal line north of the equator to that of Adelaide in the south. California is admirably located, with the Pacific coast as a western border, and the Sierra Nevada mountains as the eastern border line, and in between the large fertile inland valleys. California has a delightfully equable climate, warmer in central valleys, and cooler in the coast valleys. The rainfall varies from 8in. to 30in. in most fruit areas, but where irrigation is practised it is not seriously considered. The climate is very similar to our own, except that it is not subject to electrical storms, and has a more reliable fruit-drying season throughout the State. The soils are mostly deep chocolate loams, but where there is plenty of water available for irrigation, they are apparently getting better results in tree growth on the light sandy loams. The light sandy loam is easier and involves less work to cultivate. In some cases the accumulations of alkali salts, due to excessive irrigation and underground seepage, have caused large tracts of land to become useless. The treatment of these soils is a system of drains, coupled with heavy irrigations, by which the alkali is leached out in the drainage water. The drainage system is made up of tile pipe lines. The tile pipes are 3in. to 12in. in diameter, 2ft. long, and are laid loosely together 2ft. deep in pipe lines 50ft. apart. In some orchard lands the soils are underlaid with hardpan. The cause of the formation of hardpan is the stoppage of water in its downward penetration and the cementing together of the soil properties at the depth of penetration. The depth of the hardpan below the soil surface is usually

represented by the penetration depth of the annual rainfall. Before planting an orchard on soils of this type it is necessary to blast holes through the hardpan to allow the roots and water to penetrate. I saw flourishing orchards growing on what had been undulating land underlaid with hardpan varying in depth from 6in. to 2ft. Throughout the States orchardists lay stress on the importance of cultivation. Orchards are ploughed at least once a year. It is quite a common practice to cultivate once every six weeks during the growing season, to conserve the soil moisture. Orchards are cultivated four days after a rain or irrigation. By tests at the State farm we found that cultivation diminished evaporation on clay soils about 23 per cent., on a sandy loam 55 per cent., on a heavy loam 13 per cent. It is wise to cultivate by ploughing or disc harrowing early in the spring to conserve the soil moisture left by the winter rains. During a cultivation orchardists are always careful to leave a soil mulch on the soil surface. A good soil mulch is a loose surface layer of soil, about 4in. deep, with clods not bigger than 2in. in diameter. This mulch retards evaporation from the subsoil, breaks up the capillary action, keeps an even temperature in the soil, and stops the growth of weeds. Orchardists did not advise the use of straw mulches except for short rooted crops. When used extensively in an orchard, a straw mulch, breaking the capillary action on the soil surface, encourages root growth near the surface of the soil, and the roots are cut by the cultivator. Cultivation and ploughing are simplified by tractors, which are used extensively in the orchards and farms throughout the State. I have seen tractors used profitably on 10 acre orchards. Gasoline is 22 cents. per gallon in California, and if the tractors are properly cared for they are cheaper to use than horses. In all parts of the State cover crops, or green manures, are grown annually in orchards. During my course at the State farm experiments were made in the orchard with green manures and commercial fertilizer. The relative costs were—cover crops, 23 cents.; commercial fertilizer, 55 cents. The orchard where the cover crops and fertilizers were used produced yields of equal quantities for both cover crop and fertilizer. It is generally best to turn under green crops when their succulence is near the maximum. In this case a large quantity of water is carried into the soil. Legumes are selected in preference to non-legumes, because of the nitrogen that may be added to the soil. The green manure crops grown most were melilotus (yellow and white clovers). Using clovers as green manures approximately 40lbs. of nitrogen is added to every acre, besides increasing the soil humus. Approximately 90 per cent. of irrigable land in California is irrigated from streams. Most of the streams used for irrigation rise in the Sierra Nevada mountains and are fed mostly by melting snows. The streams in the descent from the mountains are employed in generating electricity. California's main supply of electricity is generated by hydro-electric stations built in the Sierras. In places the water is run through three separate power houses, and is finally utilised for irrigation purposes. Most farms in the State are equipped with electrical power to drive the machinery. Irrigation water is gravitation flow, and there is very little land irrigated from pumping plants, except in the Santa Clara Valley. In the preparation of land for irrigation, it is first levelled, then graded and smoothed, afterwards ditched. There are several methods of applying the water to orchards, according to type and nature of the soil. In the lighter soils furrows are used, generally six between tree rows, and not more than 300ft. long. In heavier types of soil basins are thrown up around each tree, to insure a more even penetration of water. In a few places the land had become water-logged, due to excessive irrigations or seepage. This high-water table causes trees to wilt and slowly die off. In such cases a drainage system is laid. The pipes 8in. in diameter are laid loosely together at a depth not less than 6ft., pipe lines 200ft. to 500ft. apart. In most of the larger orchards concrete pipes are used in irrigation, abolishing the open ditches, which if not concreted are costly to keep clean of weeds, besides incurring a loss of water by seepage. On a large citrus orchard that I visited the owner had erected a laboratory, principally for analysing soils, to determine the properties that they lacked. Soil moisture determinations were made each month. Soil samples were taken at every foot to a depth of 6ft., by boring with a 2in. posthole auger. The soil placed in cane is carefully weighed, and left in an electric oven for 12 hours to dry out the moisture, the temperature not being too high to burn the soil humus. On the second weighing the moisture percentage is determined. Irrigations are arranged accordingly, and since the soil moisture content has been controlled, the cost of water has been lowered and the yields of fruit increased by 30 per cent. On some of the heavier types of soil the subsoil has become compacted by frequent irrigations, and, so stopping water and the roots of plants in the downward penetration. In soil of this type it is necessary to break up the impervious layer with an implement known as a 'Killiper' or subsoiler. I saw one used on a lucerne field which would not allow the water to penetrate beyond a certain depth. The implement is V-shaped, and makes a crack 6in. wide to a depth of 6ft. It is pulled by a 75 h.p. tractor, and cracks or furrows are made 6ft. apart, leaving the earth between



cracked and loose. In most orchards trees are planted on the square, which is an advantage over other methods, as an aid to irrigation and cultivation. On hillsides, where orchards can be irrigated, trees are now being planted on the contour lines, having a drop in the rows of 2 in. in 100 ft. to allow the irrigation water to run. Orchardists advised interplanting with self-fertile fruits to secure the most effective pollination. It is particularly noticeable with prunes, and some varieties of pears, that there is a falling off in yields after the trees have reached an age of about 15 years. When interplanting it is necessary to use varieties having the same blooming periods. For interplanting with two varieties 2 x 5 rows are recommended. The common honey bee is now recognised as the most important agent in tree pollination. A large number of the orchards have a few colonies, and others hire bees from beekeepers during the blossoming period. During the last six years the horticulture division of the State farm has been experimenting with the long v. heading back methods of pruning young deciduous trees. When the results of the experiments were published, the long system was adopted throughout the State. During the whole of my tour of California I did not see one young orchard under four years pruned on the old method of heading back. This goes to prove the confidence orchardists have in the State farm and the long system of pruning. When pruned on the long system the fruiting habit of the tree is brought about much earlier than by heading back. Dr. Whitten, of the University of California, says:—' Briefly stated, the purposes of pruning are fivefold. (1) To produce a vigorous, mechanically strong, healthy tree, free from sunburn, capable of producing heavy crops over a long period of years. (2) To secure a well-shaped tree for convenience and economy in orchard management. (3) To distribute the fruiting area well over the tree. (4) To secure a succession of profitable crops. (5) To secure size and quality of fruit.' First let us outline the more important phases of the annual cycle of growth and development of a fruit tree. The tree puts out its leaves and blossoms in spring. This new growth is supported by plant food reserves, mainly starch and sugar, stored in the tree. Except for the presence of this stored reserve supply of plant food the tree could not put out its leaves. As soon as the green leaves are put out they become the source in which further supply of plant food is elaborated, or digested, to supply the daily growth and development of the tree and its fruit. Crude

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sap, taken in by the roots, is helpless to build new tissue or support further growth until it is digested in the leaves. From the leaves the digested plant food is distributed through the growing layer to all parts of the tree, where it builds up new growth. Digestion of plant food can go on in the leaves only in the presence of the green coloring matter and of sunlight. Crude plant food is carried to the leaves, and digested plant food is distributed from the leaves dissolved in water or sap. It follows then, that the larger quantities of plant food reserves are stored in shoots and spurs at the end of the growing period. The merits of the new system of pruning now being advocated are better understood in the light of the above facts. The prominent feature of the former standard system of pruning is that the trees are severely headed back each winter. As a result a rank new growth is stimulated at the top of the cut-back branches. This rank tender growth continues to lengthen and to make new leaves throughout practically the entire summer. This prevents early storage of plant food reserves and concentration of sap in the tree. In the new system of pruning the main limbs are established as early as possible. Once they are established, they are not subsequently headed back. They are pruned by thinning out surplus limbs. Not being headed back, their length growth slows down. Length growth ceases early and terminal buds form. Storage of plant food reserves begins early. The tree accumulates a more concentrated sap. Better development of fruit and fruit buds becomes possible. The tree becomes more resistant to cold. Trees severely headed back call for more moisture, or are less able to endure drought during the following summer. Dr. Whitten further adds:—'Judicious summer pruning may be understandingly practised. Indiscriminate summer pruning may severely weaken a tree. The removal of mature limbs which have ceased length growth, or of leaves that are healthy and firm, reduces the amount of plant food that may be digested and stored during the remainder of the summer. If summer pruning is severe enough to induce the production of new tender twigs and leaves, this draws upon the plant food reserves and results in a thinner weaker sap just when the tree should be storing instead of using up stored food.' Judicious summer pruning consists of the removal of any surplus, tender, succulent water sprouts that are growing where they are not wanted. Any permanent limbs that are continuing length growth too late may be checked in their growth by clipping them back. Dead, broken, or diseased parts should be removed. Thinning fruit when the trees set an overload is important. A tree may not be able to mature an overload of fruit, and at the same time furnish the plant food necessary to develop fruit buds for the following spring. The thinning out of fruit on deciduous trees is practised throughout the State. The problem of disposing of the wine grape crop in California is one of absorbing interest at the present time. Most of the 1919 crop was dried for wine-grape raisins, and a price of 10 cents per pound was realised by the grower. I have since heard that most of the crop this past season was sold fresh fruit at 120 dollars per ton. Wine-grape raisins are now used extensively for baking, chiefly for raisin bread, and the manufacture of candy. A large portion of the surplus crop is exported to France for wine-making. In 1919 a small percentage of the fresh fruit crop was used in the manufacture of cordials and grape syrup. Since the prohibition law was enforced the growers have received record prices for grapes. Orchards are apparently troubled more with pests, and are sprayed much more often than we spray. Some of the larger orchards have installed an underground spray system by which the time taken for spraying is reduced to one-quarter, and a larger percentage of the crop is saved during an attack by thrips on the blossoms. One-inch pipes connected to the mixing and pumping house are laid 2ft. deep, and hose plugs are arranged at intervals along the pipe. Twenty to 30 trees can be sprayed from one plug; 4 h.p. sprayers are used in orchards where the underground system has not been installed. The spray gun is now being used in place of the cumbersome rod. The spray gun is about 2ft. long, and most trees can be sprayed effectively by a man standing in one position on the ground. Orchards are troubled a great deal with bacterial and fungus diseases such as pear or fire blight, crown gall, oak root, and shothole fungus. Pear or fire blight seemed to be confined to certain areas. Pear trees in the Sacramento Valley are attacked badly by the blight. The Santa Clara Valley, separated from the Sacramento Valley by a range of hills a few miles in width, pear trees are not attacked. When the trees showed signs of infection, the dying back of shoots, the diseased parts were removed by cutting 9in. below the infected part. If the disease had penetrated down into a scaffold branch the limb could be saved by cutting or scraping the bark down to the cambium layer and afterwards painting over the infected parts with mercury cyanide 1-500 or bichlorate of mercury 1-500. Knives and other instruments used when treating a tree should be disinfected after use. Orchardists are careful to keep the soil beneath the tree well cultivated to bury rubbish and destroy the breeding ground of pests. The development of the fruit industry in California has been brought about mainly by growers' co-operative societies for packing and distributing the fruit, &c.

Before organising the growers were at the mercy of merchants and speculators. The four largest societies for handling dried fruits deal with—(1) prune and apricots, (2) peaches, (3) almond and walnut, (4) raisins. Each society is governed by a board of seven directors, who are all growers, members appointed by members of their respective societies. The above-named societies are not in any way connected with the marketing of the fresh fruit mentioned. When the grower sends his dried fruit in sacks to the packing shed, the society undertakes to do the weighing, cleaning, grading, packing, and attend to the business matters and sale of the fruit. Co-operation with fresh fruit growers has not developed to the same extent as with dried fruits, mainly on account of the good eastern markets for fresh fruit. The California Fruit Exchange, a separate co-operative body from the California Fruit Growers' Exchange, handles 25 per cent. of the fresh fruit shipments. The apple and pear growers are now building co-operative cold storage sheds for storing their fruit. I visited a large cold store near San Jose, with a capacity for storing 1,000 tons of fruit. When fresh fruit is sent by rail to the Eastern markets, the cases are packed in refrigerating cars and the temperature is kept at about 30° during the journey. When the cars are loaded with warm fruit, cool air is pumped through the cars for several hours until the fruit is thoroughly cooled. Ice boxes at both ends of the car are kept full of ice *en route*, to keep the temperature at a constant level. Co-operation amongst citrus growers goes back to 1895. The California Fruit Growers' Exchange, and the California Fruit Growers' Association, the oldest co-operative businesses, are formed by a body of 'locals.' The function of the local association is really the physical handling of the fruit. The local association always grades, packs, and pools the holdings of its members. The 216 locals of the California Fruit Growers' Exchange are divided into 20 groups known as district exchanges. They are the medium for the transaction of all business between the local on one hand and the central on the other. They put locals in touch with opportunities to make sales and confirm them through the central body. The California Fruit Growers' Exchange spent in 1920 750,000 dollars in advertising the 'Sunkist' brand of citrus fruits. They built a number of fine packing houses and cold storage plants. They own their own timber, operate two timber camps, and make their own boxes. When citrus fruits are handled at the packing house, they are first washed, brushed, fanned, and graded by machinery, then culled and packed in standard packs by girls. The standardisation laws compel the canneries and all packers of fresh and dried fruits to grade, class, and label their products. The largest cannery that I visited (a co-operative business) graded apricots into eight sizes, and in four classes—(1) Standard, (2) choice, (3) fancy, (4) extra fancy. The small fruit was made up for jams. The cans were labelled accordingly. Packers of fresh fruit have similar grades and classes of fruit, so that a buyer in an eastern market sending for a consignment of fresh, canned, or dried fruit, knew exactly what is coming to him. The Fresh Fruit Standardisation Law of California requires that all pears or apples packed for shipment or sale be—(1) Practically free from insects, (2) practically uniform in size, (3) practically uniform in quality, (4) practically uniform in maturity. Practically free from insects means not more than 3 per cent. of any one defect, and not more than 10 per cent. defects in any one package. Evaporating machines for drying fruit were used in some instances as an insurance against rainy or unsuitable weather during the drying period. Although the machines are only in the experimental stage, they are being improved on every season, and the prospect of further developing the evaporated fruit and vegetable industry by the machines is very promising. I saw several commercial machines which were mainly forced hot air draught, although some were of the kiln stack and others worked with a vacuum. The evaporators dried grapes in 12 hours, and prunes in 18 hours, making a cleaner, more saleable product, free from dust. In 1919 Californian nurserymen formed into a group for the purpose of bud control. Many of the trees propagated in nurseries were not true to variety, and the object was to get nurserymen to select buds for budding from standard trees. The county horticulture and farm advisor stations have contributed largely to the development of the fruit industry. These stations are controlled by the State experimental farms, and keep farmers advised on farm management, pest control, and the result of any new experiments carried on at the experimental farms. The prospect of a new development in horticulture on Californian lines in Australia is apparently not far distant. If we can establish a firm overseas trade in fresh, dried, and canned fruits, there is every reason to believe that Australia will command one of the biggest positions in the world's markets.' (During the past few months many excellent papers have been read before members of the Agricultural Bureau dealing with experiences gained abroad with the Australian Imperial Forces. Space limitations have made it impossible to print these in the *Journal*. However, the paper printed above has been included in order that readers might have the opportunity of gaining some general idea of the way in which members of the Bureau who have served overseas have profited by their experience.—Ed.]




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### MOUNT PLEASANT (Average annual rainfall, 26.87in.).

February 11th.

A discussion took place on the working of lucerne paddocks. Members thought that the plant should be at least three years old before cultivated to any depth. Rye was considered the best for early winter feeding, followed by barley, both crops to be sown on fallowed ground. The Chairman (Mr. V. Tapscott) spoke briefly on dairy farming. It was agreed by all present that the summer had proved one of the best in that district for the quantity of milk and butter produced, owing to the quality of the natural grasses.

**ASHBOURNE, January 24th.**—The Poultry Expert (Mr. D. F. Laurie), attended the meeting and delivered a lecture "General Poultry Farming."

**LENSWOOD AND FOREST RANGE, February 19th.**—The following programme for the period ending June 11th, 1921, was compiled:—March 19th, inspection of Messrs. Lawrance and Schultz's orchards; April 16th, paper, "Fruit-drying," Mr. R. J. Townsend; May 14th, paper, "Utilising the Hills After the Timber is Gone," Mr. J. Green; June 11th, paper, Mr. W. McLaren.

## SOUTH-EAST DISTRICT.

## MOORAK.

January 20th.—Present: 10 members.

**CARE OF MILK.**—In a paper under the heading, "Cleanliness, the Dairyman's Greatest Friend," Mr. K. Bowen said with the advent of the separator, milking machine, and refrigerator, a very considerable impetus had been given to the dairy industry, and a higher standard of purity laid down. Increased cleanliness was necessary to comply with those standards. In the future the industry would still further expand, and thorough cleanliness would be absolutely necessary to cope with the demands of the exporter. How then were they to obtain such results? It was certain if the milker's hands were dirty the milk would at once be contaminated. The same remark applied to machines with dirty teat cups. It was also necessary to see that the rubber tubing which conveyed the milk to the reservoirs was properly cleansed, as the germs gathered in the pores of the rubber, and thus contaminated the milk. In his opinion it was essential to have a bucket or some such receptacle containing water so that the hands could be washed when they became soiled during the milking. That also led to the necessity of washing the cow's teats with warm water before milking, for clean hands and dirty teats would not give such good results as clean hands and clean teats. He believed it would be a good practice if each member of the family, as he went to milk, took with him a can of warm water. No excuse could then be made for dirty hands, as a can of water would be provided for each bail. When a cow lies down, unless in a good grass paddock, dirt adhering to her udder and teats would be prevented from coming into contact with the milk by the use of the

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warm water before milking. Nothing, perhaps, required more care than the utensils used in the course of milking and also in the transport to the factory. If any dirt or stale milk was allowed to remain in the buckets, strainer, or cans, early decomposition of the whole of the milk would commence. All utensils, after being used, should be washed in cold water, and then thoroughly scalded, and allowed to drain and air. They should not be rinsed with cold water, as was sometimes done. A little washing soda or lime added to the water had a sweetening influence on them. Sufficient importance was not attached to the cowshed proper and the bails. If allowed to remain in a dirty condition they became a breeding ground for all germ life, which would, if care was not taken, find its way into the milk bucket. A good solid floor was necessary, and water laid on if possible, so that it could be washed down after each milking. If the bails and all the woodwork were whitewashed at intervals, not only would the shed be clean, but the whole appearance would add to the attractiveness of the work. Milking, instead of being such drudgery, would become more of a pleasure. The yards in which the cows stood while waiting to be milked also needed attention. All the old manure should be removed, and if some system of cleaning were used each day it would no doubt save time, and also tend to keep the yards in a sanitary condition. The sunlight was a great help in that respect, as it was the best disinfectant. The milk drawn from the cows should be set in a cool place, as free from dirt and dust as possible, until such time as it was forwarded to the factory. In actual transportation care should be taken, especially in the summer, to keep the hot sun from striking on the cans, as that depreciated the value of the milk. A wet bag or a few small branches of a tree spread over the cans would have the desired effect. If they wished to secure the best price for their products they should make it possible for the factory manager to produce the very best quality product by being thorough in the methods of cleanliness.

#### MOUNT GAMBLER (Average annual rainfall 32in.).

February 12th.—Present: 15 members.

CONSUMING PRODUCTS ON THE FARM.—Mr. R. P. Pritchard, in a paper on this subject, said most farmers had, at one time or another, experienced a difficulty in disposing of the whole of their produce. His idea was that farm products, when unprofitable to sell, should, if possible, be consumed on the farm. At the present time he was using barley for pig-feeding, and it was a good paying proposition at the present price of pork and the low price of barley. Speaking of oats, he said the best way to use them was to crush and feed them to cows. Again, if a person wanted to keep a cow in a backyard in town, with no grass available, it would be possible to carry it on with crushed oats and a little roughage like chaff. His cows had reached that stage where they were going off very rapidly, so when the grass gave out he had oats ready, and crushed them. He started feeding them on that, and every cow improved wonderfully. To-day they were giving very satisfactory returns. Before giving the cows crushed oats they were on millet for about two hours a day. He started feeding oats to 29 cows, and gave each animal about 5lbs. per day, with the same quantity of chaff. That meant three double handfuls of each fodder for each meal. The results were that his returns represented £1 a bag for the oats that the cows consumed. He strongly recommended dairymen to give crushed oats a trial. Mr. J. Livingston, M.H.R., then gave an address, "Sugar Beet Growing."

#### PENOLA (Average annual rainfall, 26.78in.).

February 5th.—Present: eight members.

INCREASED PRODUCTION.—In the course of a paper dealing with this subject, Mr. S. Ockley first remarked on the improvements that had taken place in the manufacture of farm implements and machinery. Continuing, the speaker said the judicious manuring of the land and the improvement of stock should be matters of serious consideration for the farmers in that district if they wished to increase the producing and carrying capacity of their holdings. Economic conditions were

tending to so increase the returns from livestock that the value of pasture was considerably enhanced, and the wisest procedure for farmers in that district of assured rainfall was to aim at the improvement of their pastures. The increased value to the grazing capacity of a field following the harvesting of crops manured with superphosphate was undisputed, and the sooner one could economically apply a ton of super per acre the sooner he would realise that increased grazing was possible—that meant, crop often and manure heavily. Towards that end their climatic conditions aided them, because summer crops could be successfully grown. By growing a crop of millet or rape on the fallow with 1 cwt. of super per acre, and then following with a cereal crop also heavily manured, one's land would accumulate a supply of phosphates in a profitable manner, and represent a considerable increment. The paper concluded—"Summed up, to obtain increased returns and improve one's holding on economic lines, use up-to-date implements, cull rigidly, and manure heavily."

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FRANCES, January 29th.—Several matters of local interest were brought before the meeting. Members also discussed the question "Tuberculosis in Cattle."

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### UTILISING EXCESS SUMMER FODDERS.

The rainfall experienced during the past few months has been most satisfactory from the point of view of summer fodder crops, and at least one farmer in South Australia finds himself in the somewhat unusual, but nevertheless enviable, position of having more sorghum and Sudan grass than his stock can eat. And in seeking advice as to what to do with his crop, he mentions, perhaps somewhat regretfully, that he has no receptacle in which to make ensilage. To make the best of the position, the Superintendent of Experimental Work (Mr. W. J. Spafford) suggests using the sorghum as greenfeed, and making hay of the Sudan grass. Although rather coarse for that purpose, Sudan grass cures readily, and is eaten by livestock after being stored in this way. In the absence of a silo, or dry dam, in which to make ensilage, the excess summer crop can be stored as stack ensilage.

The crop should be cut, stacked the same day as cut (making a rectangular stack relatively high in proportion to its size), and weighted down as soon as stack is completed. A simple way of weighting the stack is to pass fencing wires across the stack, about 9 in. to 12 in. apart, and hang heavy weights (up to 3 cwt.) on each end of the wires. These weights should be fixed to the wires as high as possible off the ground, say, from a wagon frame or side of a dray, as the material rapidly sinks, and if not placed well up, the weights will soon rest on the ground. As soon, and as often as the weights get near the ground, they should be raised and refixed to the wires, high up.

# CROWN LANDS.

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## LANDS TO BE OFFERED SHORTLY.

Additional allotments in the town of Whyalla (Hummock Hill) will be offered at auction at an early date.

Lands in hundreds of Allen, Bews, Billiatt, Chesson, Cotton, Dudley, Dutton, Ettrick, Hall, Holder, Haines, Jellicoe, Kadina, Kekwick, Livingston, Marmon Jabuk, Macclesfield, Mantung, McPherson, Molinsux, Nangkita, Noarlunga, Parilla, Price, Peebinga, Pirie, Roby, Strawbridge, Tiparra, Wilson, and Waikerie.

Full particulars will be published in the *Government Gazette*, and plans will shortly be available on application to the Secretary for Lands, Adelaide.

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## APPLICATIONS FOR LAND.

Intending applicants for any lands which are open are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portion of a block, if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey.

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## ALLOTMENTS, SALES, TRANSFERS, SUBLEASES, AND MORTGAGES.

Notice is hereby given that in future no applications for land, or for transfer, sublease, of mortgage of Crown leases or agreements will be approved to unnaturalised persons of any nationality, or to naturalised persons of enemy origin unless the consent of the Honorable the Attorney-General of the Commonwealth be first obtained by the parties making the application.

Where any doubt as to nationality exists, it will be necessary for certificate of birth or naturalisation papers to be exhibited.

The same principle will apply to land sold by auction.

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## OFFICIAL LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which may be seen at the principal Post Offices, and copies obtained at the Office of the Secretary for Lands. The List shows the Areas, Localities, Prices, &c., of the Sections available and the conditions under which they may be applied for.

G. R. LAFFER,

*Commissioner of Crown Lands and Immigration.*





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